The Newspaper of Information Systems Management
August 1, 1994, Vol. 28, No. 31, 106 Pages, $6/Copy, $48/Year

COMPUTERWORLD

Wanted: PowerPC software

IBM, other vendors to deliver hardware this fall

PowerPC rollout

These upcoming events look to shape PowerPC's future from the IBM side of the industry

August	AIX 4.1 to ship
August	IBM to sign contract with Totally NonTechnical Solutions to provide a voice-capable layer in OS/2 for PowerPC
September	Zenith Data Systems, Motorola to announce PowerPC systems
October	IBM to announce hardware
Year's end	Apple/IBM/Motorola PowerPC Reference Platform (Prep) standard negotiations to be completed

By Ed Scannell and Michael Fitzgerald

As IBM and other vendors edge closer to releasing their first PowerPC hardware and operating systems, one might ask: Why should customers care?

Robust hardware and operating system software may be important components, but applications are why users buy boxes. Yet the upcoming hardware and compliant operating systems will have few 32-bit applications ready to take full advantage of the PowerPC.

"The core of [our buying decisions] is we have to buy a machine that will run the software that's

PowerPC, *page 101*

Net management rift grows wider

By Elisabeth Horwitt and Steve Moore

Hewlett-Packard Co. and IBM are expected in the next few weeks to begin the long-awaited rollout of their distributed network management platforms. But users would much rather the vendors take that step together — as originally expected — than separately.

Indeed, there is an increasing number of incompatibilities between the products of the two leading enterprise management providers, once partners and now fierce competitors. That estrangement is effectively blockading the industry's efforts to provide commonality and interoperability across multivendor management platforms, analysts and users complained last week.

While users want a selection of the best network management

Net management, *page 16*

IBM and HP plan to mesh their offerings via DCE and CORBA standards, but products still seem to be years away.

IBM eases host move

By Craig Stedman

IBM this fall will introduce low-end versions of its CMOS-based System/390 machines that can run older releases of the MVS operating system and other mainframe software, according to sources familiar with the company's plans.

The move will allow users to start migrating from traditional mainframes to the less expensive parallel CMOS machines without the pain and expense of upgrading their software.

"Right now, I can't see a way of [moving to the parallel hardware] unless I rip out everything that I've got," said Larry Duntz, assistant manager of computer services at Beech Aircraft Corp. in Wichita, Kan. "I'm looking for a way to get there so I can evolve."

The ability to run older software will banish an initial requirement

IBM, *page 16*

Agents spy Internet data

By Mitch Betts
LANGLEY, VA

After decades of viewing public information as practically useless, U.S. intelligence agencies are planning to exploit the wild and ultrapublic internet in search of cheap but useful nuggets of information.

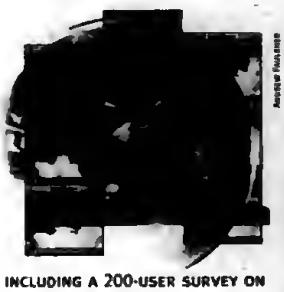
By summer's end, the Central Intelligence Agency and five other intelligence units will hook up to the Internet to collect and share "open-source," or unclassified, information, CIA official Joseph Markowitz confirmed.

The six-node Internet link will give intelligence analysts "an access point to the internet at large," including access to electronic mail by subject-matter experts across the globe, Markowitz said in a recent interview. He is director of the CIA's Community Open Source Program Office, which opened March 1.

The Internet will be a gateway to commercial on-line information

Agents, *page 101*

MULTIMEDIA COMES DOWN TO EARTH



DESPITE HIGH START-UP COSTS AND COMPLEX SYSTEM DEMANDS, THIS ONCE-HYPED TECHNOLOGY IS LANDING SQUARELY IN CORPORATE IS.

OUR CW GUIDE TO MULTIMEDIA, INCLUDING A 200-USER SURVEY ON THE LATEST AUTHORING TOOLS, STARTS ON PAGE 67.

Graphical interfaces

GUIs still a sticky issue

By William Brandel and Lynda Radosevich

Listening to users discuss the merits of graphical user interfaces these days is like listening to parents weigh the educational value of a Super Nintendo game. It may be highly visual, slick and colorful, but is it really good for you?

WINDOWS.WORLD

If last week's Windows World in Chicago is any indicator, new graphical operating systems and applications will continue to be pitched as more intuitive solutions. However, the complexities of a growing number of features — which GUIs are supposed to mask — still far outstrip gains in ease of use.

Moreover, with new renditions of "intuitive" software, such as the new GUI in Microsoft Corp.'s Chicago, vendors break the consistency of look-and-feel features that graphical environments once promised.

For information systems managers, all of this ultimately means greater expense. Just as they dished out training dollars to move from DOS to Windows, they must now prepare to fork over more training money to move to Chicago, the next major upgrade of Windows.

GUIs, *page 20*

Newspaper
#BXBBJFT********** 5-DIGIT 48103
#UIU7ZE300M099039# 0040111580
UNIVERSITY MICROFILMS INT * 0016
UNIVERSITY MICROFILMS INT 0011 6 XC
SERIAL PUBLICATIONS
300 N ZEEB RD
ANN ARBOR MI 48103-1553

A PUBLICATION OF IDG

What's Inside

August 1, 1994

Pay-per-performance schemes can be a good way to bolster quality and attune employees to corporate business goals. But knowing how to best carry out those schemes isn't always easy. As **Community Mutual CIO Bill Eager** knows, IS managers who want to avoid the pitfalls have to know how to pay the game.

See page 62

NEWS

■ A Tennessee **software engineer** thinks he's found a way to use his title and remain on the right side of the law. *Page 24*

■ **Sun Microsystems** is not about to rest on the success of its workstations. New strategic arenas for Sun include imaging and multimedia for both the corporate and home markets, according to CEO and President Scott McNealy. *Page 28*

■ Last week's **personal communications services bidding** was still going hot and heavy as of press time, auguring higher prices and limited competition for narrow-band services including two-way and acknowledgment paging. *Page 14*

COMPUTER INDUSTRY

■ **Seagate** acquires Palindrome, third in a series of software acquisitions. *Page 32*

DESKTOP COMPUTING

■ Users are saving money while hardware vendors are trying to outdo one another with **service and support** options. *Page 39*

■ The Rite Aid drugstore chain is putting the finishing touches on a **2,700-store Unix machine rollout**. *Page 41*

WORKGROUP COMPUTING

■ More vendors are offering **LAN management outsourcing**, but customers are still concerned with security and costs. *Page 43*

ENTERPRISE NETWORKING

■ **Cabletron and Cisco** are offering free technical support to woo customers away from Wellfleet and SynOptics, but some users are still on the fence. *Page 49*

■ Want to get connected? Check out this **Internet** column. *Page 49*

■ **The Automobile Association of America** is driving down the frame-relay path to connect its offices around the country and provide better service to its members. *Page 50*

LARGE SYSTEMS

■ An atmospheric research center tried virtually every **supercomputer** under the sun before it made a decision. *Page 55*

■ Some people will **buy anything through the mail**, even an AS/400 computer. Most, however, are using IBM's catalog to buy additional disk storage and other smaller supplies. *Page 56*

APPLICATION DEVELOPMENT

■ **Microsoft** is running hard to keep its promise of **allowing 16-bit and 32-bit applications to interoperate** in Daytona. *Page 59*

IN DEPTH

Teamwork works both ways. Business managers need to assume some accountability when IS projects blow up. *Page 77*

CAREERS

■ **Has GUI development got you down?** Here are 10 tips for cleaner, more usable screens. *Page 80*

MARKETPLACE

■ **Multimedia authoring tools** promise slick results, but the learning curve may be tougher than you expected. *Page 90*

COMMENTARY

■ Microsoft could have been nailed more completely had the industry not cried wolf too soon, **Charles Babcock** says. *Page 6*

■ **Bill Laberis** writes an obituary for the mainframe. Not! *Page 36*

■ **Max D. Hopper** writes about the fashion police. *Page 37*

■ **Jerrold M. Grochow** explains how Maslow might have applied his Hierarchy of Needs to the computer industry. *Page 37*

■ **Jeffrey Henning** explains how to distribute batch jobs across a network of Unix workstations and avoid wasting MIPS. *Page 43*

■ Computer Associates has succeeded despite not being a member of the software industry club, **Paul Gillin** says. *Page 55*

Calendar ..... *Page 64*
Company Index ..... *Page 98*
Editorial/Letters to the editor ..... *Page 36*
July 29 Stock Ticker ..... *Page 99*
How to contact Computerworld ... *Page 102*

Executive Briefing

Network management is heating up with products, vendor wars and standards efforts. IBM and Hewlett-Packard are on the verge of announcing distributed versions of their now-separate products — solving some problems while creating others. *Page 1.* Meanwhile, after languishing for years as a network operating system also-ran, **Banyan** seems on the verge of taking the lion's share of the enterprise network services market. *Page 12*

On the network standards front, the Desktop Management Task Force is expected this week to release some specifications for remote configuration and management of desktop systems; a new version of the Internet Protocol leaves customers wondering if the transition will be worthwhile; and McAfee Associates pushes its interfaces as industry standards. *Pages 8, 12 and 44*

Digital's negative financials have little impact on customers, some of whom are still content with the balance sheet and others of whom are more concerned about what Digital will sell in the future. For now, Digital is hawking its new high-end workstations. *Pages 8 and 44*

As IBM consolidates its PC Co., Dell prepares to reenter the notebook market. *Pages 4 and 6*

Apple users gear up for PowerPC versions of Excel and Word as networking incompatibilities surface between 68000-based Macintoshes and PowerPC-based Macintoshes. *Pages 6 and 15*

Microsoft users expect business as usual, legal experts explain why the Department of Justice did not go after a stronger case, and IBM prepares to take full advantage. *Pages 10 and 39*

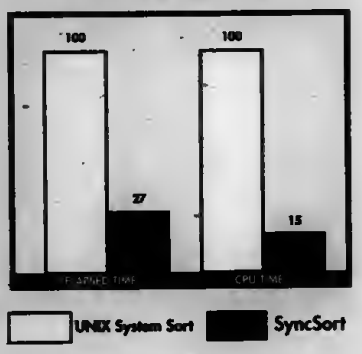
At the Object World trade show last week, IBM previewed development tools. Other vendors demonstrated interoperability between the OLE and CORBA object models as well as a distributed version of OLE. *Pages 14 and 59*

Oracle customers got a chance to lob questions at some of the major application tools vendors last week as they took a look at a bridge that spans the relational and object worlds. *Pages 20 and 55*

Even though client/server is one of the hottest markets around, its tool vendors are having major growing pains as they transition their wares to better serve corporate customers. *Page 32*

The 5th Wave *by* Rich Tennant

PERFORMANCE



FUNCTIONS

	UNIX System Sort	SyncSort
RECORD FORMATS		
Fixed length binary	NO	YES
Variable length binary	NO	YES
ASCII Text	YES	YES
RECORD PROCESSING		
Selection	NO	YES
Reformatting	NO	YES
Summarization	NO	YES
Grouping	NO	YES
COLLATING SEQUENCES		
Standard ASCII	YES	YES
EBCDIC	NO	YES
User Defined	NO	YES
Multi-byte	NO	YES

UNIX has its advantages, but its System Sort isn't one of them.

All it can do is sort ASCII text – slowly!

SyncSort provides the performance and functionality you need to make your commercial UNIX applications work.

To order SyncSort or for a FREE copy of our booklet – *Making Your Commercial UNIX Applications Work* – call us.

syncsort

(201) 930-8200 dept.123

The UNIX System Sort

XINU

IBM cuts PC force, kills Ambra Corp.

By Jaikumar Vijayan

■ In a move anticipated for some time but still surprising in its scope, IBM announced it will reduce the head count of its IBM PC Co. by 2,000 and relocate employees from nine different sites to Raleigh, N.C.

At the same time, IBM also announced it will permanently close Ambra Corp. in the next 90 days. Current Ambra customers will receive support from the PC Co.

IBM's reorganization, which also affects its Power Personal Systems division, merges the PC Co.'s seven development and brand marketing organizations into four product categories. It also consolidates most manufacturing, development and marketing operations into the Raleigh location.

Eases state of confusion

For users who often complained about a confusing overabundance of similar desktop products from the PC Co., IBM's efforts could result in clearer choices and more reliable product availability and support, analysts and users said.

"To the average buyer, IBM's product lineup often tends to get confusing," said Robert Haas, MIS manager at Intoreo, Inc. in St. Louis. However, this problem is not unique to IBM, he added. For Haas, a former all-IBM user and a recent Compaq Computer Corp. convert, pricing and support were more crucial in his decision to switch

"The fact is, IBM simply overchoiced its customors and is now trying to apply tho KISS [Keep it simple, stupid] approach to their PC business," said consultant Sam Albert, president of Sam Albert Associates in Searsdale, N.Y.

IBM's effort to slim down and streamline PC operations comes at a time when its PC sales have slipped to third in the industry. Some observers view the move as an overdue step toward recovering some of the turf IBM recently lost to Compaq and Apple Computer, Inc., at least in the U.S. While IBM's PC sales were lower than its sales during tho same period last year, both Apple and Compaq have increased their market share, according to figures from International Data Corp. (IDC) in Framingham, Mass. (see story below).

"Compaq has taken the initiative by keeping its eye on the ball. People see IBM flailing about and have begun to put trust in companies like Compaq," said Jennifer Munson, a research analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

Adding to IBM's woes is its $600 million inventory pileup, which has clogged the channel with thousands of ValuePoint systems that the company is now trying to auction. Some observers say the recent inventory backup could accelerate IBM's efforts to fill a major portion of its ordera throagh build-to-order manufactaring.

Criticized in the past for its excessively fragmented PC operations, IBM will centralize worldwide manufactaring, development, procurement and customer fulfillment at its facilities in Research Triangle Park, N.C. Similarly, IBM will move its Power Personal Consumer development teams from Lexington, Ky., Kingston, N.Y., and Boca Raton, Fla., to North Carolina.

The coosolidation is expected to eliminate 1,500 to 2,000 jobs, primarily at the PC Co., in the next 45 days, according to a memo from Richard Thoman, a senior vice president and group executive at IBM

"It was a tough decision for IBM to make, [but] it should have been made a long time ago. It was essential," said Richard Zwetchkenbaum, an analyst at IDC. Zwetchkenbaum said the reorganization will allow IBM to knit a stronger and tighter PC operation.

"Things were far too fragmented at IBM, and branding was way out of whack," Zwetchkenbaum said. He said IBM's PS/1 operation has marketing people in Atlantic City, development teams in Lexington and brand management teams in Somers, N.Y.

Reorg ramifications

IBM's reorganization will affect the PC Co. and the Power Personal Systems divisions to varying degrees. The highlights of the reorganization include the following:

- **In addition to one current general manager, three new general managers will oversee and coordinate worldwide development and brand marketing of four distinct product categories: desktop, server, mobile and aftermarket/services.**
- **IBM's Research Triangle Park, N.C., facility will become the North American development and brand marketing headquarters. Research Triangle Park will become home to almost all development, manufacturing and marketing operations of the PC Co.**
- **The bulk of the PC Co.'s consolidation, which involves product development moving from Boca Raton, Fla.; Boulder, Colo.; Atlanta; Kingston, N.Y.; and Lexington, Ky., to RTP, will be complete this year. Procurement operations for the PC Co. in Boca Raton and East Fishkill, N.Y., will move next year.**
- **The majority of Power Personal Systems' product development will remain in Austin, Texas, and Boca Raton.**

Oracle to test single-user database

By Kim S. Nash

Two firsts are brewing at Oracle Corp.

With a tardy nod to the popularity of desktop databases, Oracle plans this year to ship a version of the Oracle 7 database for Microsoft Corp.'s Windows 3.1 environment, an Oracle manager said last week. Separately, Oracle's so-called Project X single-user database and graphical development tool kit is due to start beta testing in late September, another company insider said.

Most notable about Project X, users and analysts said, is that it builds on Microsoft's Visual Basic scripting language instead of foisting its own on developers. Moreover, unlike client/server tools rivals such as Powersoft Corp. and Gupta Corp., Project X will not require users to learn a proprietary programming language.

"That's pretty forward-thinking," said Nicole Roth, an analyst at International Data Corp. in Framingham, Mass.

The new products would plug some gaping holes in Oracle's low-end line, which has been a trouble spot for users who have longed for Oracle to support Windows PCs.

"It's nice that Oracle is acknowledging PCs more. They haveo't been strong there," said Rita Palanov, vice president of the Northern California Oracle Users Group.

Oracle 7 for Windows recently went into beta testing, said Keith Majkat, senior member of the technical staff at Oracle, during an on-line CompuServo, Inc. cooference last week. The product is also a 32-bit database and therefore runs under the Win32s application programming interface.

Some users wondered whether the pairing of a full-function Oracle 7 and Windows is just too fat.

Oracle is a memory hog and must be slimmed down if the database is to run on low-end, Intel Corp.-based hardware, some users said. "I tried using a past version of Oracle on PCs and couldn't run any other applications when I had the database up," said Kandice Samuelson, MIS manager at Intercraft Co. in Taylor, Texas.

"I can't imagine squashing down all of [Oracle's] overhead to fit on a PC," Samuelsoo said, adding that Intercraft recently bought Microsoft's Access for PC database applications.

The product "does have a 'healthy' memory requirement," Majkut said. Oracle 7 on Windows requires 16M bytes of memory, including the Oracle PL/SQL language. Without PL/SQL, 8M bytes are needed. The PC database also demands 30M to 50M bytes of disk space and at least a 486-based PC.

Potential danger

Meanwhile, conflicting reports have surfaced regarding the fate of Project X even before it sees daylight. If Oracle follows through on implied threats to take over Gupta, Project X could be in danger. As one Oracle employee put it, Project X "is a skunk-works effort. The investment . . . isn't so much that if [Oracle] got something that does the same thing, they couldn't yank it."

But Marc Benioff, vice president of Oracle's client/server systems divisioo, maintained that a Gupta acquisition would not impact tho product. Rather, Project X "is aimed directly at Microsoft, [and] there is little overlap with Gupta tools," Benioff said.

HP tool aids Oracle 7 users. See page 55.

Compaq holds No. 1 spot over IBM, Apple

By Jaikumar Vijayan

For the second straight quarter, Compaq Computer Corp. outstripped IBM PC Co. in unit shipments of PCs, according to figures from International Data Corp. (IDC) in Framingham, Mass. Compaq sold 1.5 million PCs worldwide in the second quarter, followed by IBM with 900,000 and Apple Computer, Inc. with 850,000.

In the U.S., Compaq's 585,000 units led Apple's 465,000 and pushed IBM — with 390,000 — to third place, IDC said.

In the same quarter a year ago, IBM led Apple and Compaq with 890,000 units. Compaq appears to be the biggest gainer since then, according to IDC figures. The Houston vendor, which was third in PC sales last year, has emerged on top of the desktop market.

Eyes on the prize

Compaq's performance in the first half of the year puts it on course to wrest desktop market leadership away from IBM by year's end, according to Richard Zwetchkenbaum, an analyst at IDC.

"Compaq is just confirming what it said it would be doing," he said.

Early figures from IDC indicate that another company setting a blistering pace for the first half of the year was Acer America Corp., which had projected sales of 92,000 units — up 92% from the same period last year.

While Everyone Jumps On The Client/Server Bandwagon, Allow Us To Introduce Something Better.

Client/server alone is not enough.

You need HR expertise as well.

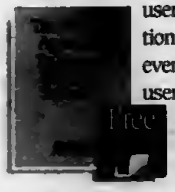
And now there's finally an HR software package that gives both.

Introducing new CA-HRISMA.™

The absolute latest client/server technology. Designed around a solid foundation of HR experience. That's the unprecedented combination that sets new CA-HRISMA apart from other HR software.

It's a completely integrated solution that covers all your payroll, personnel and benefits needs with true client/server, GUI-based software that supports both distributed and centralized processing.

It's flexible. Friendly. And incredibly easy to work with. An abundance of end-user access and customization options will keep everyone from the power user to the beginner smiling.



CA-HRISMA was designed by HR professionals for HR professionals. For over two decades we've helped thousands of clients take care of millions of employees.

Call 1-800-225-5224, Dept. 50102, For A Free Demo Disk And Booklet.

Call today and we'll show you how you can leave that bandwagon far behind.

COMPUTER ASSOCIATES
Software superior by design.

Introducing CA-HRISMA™

THE HUMAN RESOURCE SOFTWARE THAT'S DESIGNED FOR HUMANS

© Computer Associates International, Inc., Islandia, NY 11788-7000. All product names referenced herein are trademarks of their respective companies.

The danger of crying wolf

Microsoft's critics cried wolf and called in the government too soon. Now they reap the reward of a toothless settlement, and a powerful federal agency backs away from the scene.

The desktop behemoth has certainly shown a persistent knack for adroit, marginally anticompetitive practices. But Microsoft could have been counted on to overstep the rules — if left to its own devices a little longer.

But no. Its competitors, filled with anxiety, turned to the Justice Department and ultimately failed to produce the body of evidence showing that Microsoft got to its near-monopoly position in desktop operating systems through chicanery.

What Microsoft did was produce PC DOS at the behest of IBM; it then worked on OS/2 when IBM said it wanted to address the high end of the desktop market. IBM claims there was trickery, since Microsoft, after many months work, shifted its public emphasis to Windows. But that charge has always sounded hollow to me.

Microsoft could have been counted on to overstep the rules — if left to its own devices a little longer.

Charles Babcock

Microsoft left IBM a larger opening to take ownership of and sell OS/2 than IBM left many smaller firms over the years as it codeveloped products in their areas. As a young company, Microsoft deserved credit for standing alongside the computer giant and refusing to be overshadowed by it.

Microsoft *chose* to sell Windows over OS/2 because of its savvy insight into the nature of the desktop end user. It charged low prices and sold millions of copies. It didn't merely exploit the desktop revolution; it poured system software on it like fuel and then fanned the flames.

At the same time, Microsoft published the details of its operating systems and cranked out waves of languages and tools for developers: Microsoft Basic, C, C++, Visual Basic, Visual C. Legions of programmers began looking to it for leadership — a business asset that could only accrue to a company that had come to be identified as the eye of the desktop revolution storm. And that's what has brought Microsoft to its current, dangerous position.

It stands astride the system software field looking hungrily at its neighbors' turf in applications and networking. With its system software dominance, it possesses an unparalleled opportunity to gain in those areas. Technically, it can hide advantages in its operating systems on behalf of both its applications and networking. Financially, its huge operating system revenue base sustains price-slashing on individual products in other areas.

In effect, this is the subterranean "bundling" issue of the 1990s that the Justice Department was unable to address.

Microsoft's competitors are now sure that it will press its advantage. After all, it did so when it had the opportunity to purchase the Fox Software clone of dBase after it was cleared of legal difficulties. And it did so with an early release of a bargain-basement Access database before Borland could upgrade Paradox. Both moves were major blows to Borland, and it has yet to recover.

Microsoft also pressed its advantage in 1990 when Lotus and WordPerfect thought they were committed, along with Microsoft, to developing applications for OS/2. Microsoft shifted its focus and gained the upper hand in early Windows applications.

But so far, there is little evidence that Microsoft has done anything but take the lead through sharp, legal business practices.

At times one wonders why Lotus, Novell and WordPerfect didn't complain less and concentrate more on their own Windows applications.

Nevertheless, Microsoft's advantage remains. It will almost certainly manifest itself in future competitive moves. When it does, its competitors will once again cry wolf. And then the Justice Department will have to demand a body of evidence that really includes a few bodies.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

Apple compatibility concerns accompany users to MacWorld

By Mark Halper

As Apple Computer, Inc. users head to the MacWorld Expo in Boston this week, they will have a number of networking and cross-platform challenges on their minds.

In the near term, users will leave behind shops where they are on the lookout for creeping incompatibilities that have surfaced between networked 68000-based Macintoshes and PowerPC-based Macintoshes.

An Apple spokesman said the two machines use different packet technology for sending data over Apple's LocalTalk network, and this has caused network slowdowns in some isolated cases.

Apple is providing network system installer software as a solution to the problem, the spokesman said.

What you need

The Top 3 needs of Macintosh users, according to MacIS, are better networking with other environments through operating system enhancements, improved support for Windows and emulation for Chicago when it is available and enhanced network security and administration.

Tip of the iceberg

Valerie Takumoto, a technical staff member at The Aerospace Corp. in El Segundo, Calif., gave a more severe account.

"They're only isolated cases because they haven't sold enough Power Macs yet," she said. "And it's not a performance slowdown; the system freezes."

The Aerospace Corp. has about 2,000 Macintoshes with several enclaves of LocalTalk networks tied into an Ethernet backbone. The enclaves can not talk locally through LocalTalk if even one Power Macintosh is used, Takumoto said.

"If they add one Power Mac, we have to put them on Ethernet whether they want to or not, and all their traffic comes with it," she said.

The Top 10

Broader, long-term networking concerns are also very much on the minds of corporate Macintosh users, according to a list of "Top 10 Issues" published last week by the MacIS user group in Mason, Ohio.

The list showed that more than anything else, corporate Apple users are eager to see Apple deliver on promises to more fully embrace the TCP/IP and IPX network protocols that drive Unix and Novell, Inc. networks.

"My goal for the Power Mac is I want to have three environments running simultaneously — Macintosh, Windows and Unix," said Dave Lustig, manager of network services at Bose Corp. in Framingham, Mass.

Still, Apple has taken large steps toward addressing users' networking concerns this year by implementing TCP/IP support in its new System 7.5 operating system. The vendor has also committed to supporting NetWare on Apple servers once Novell releases its 4.1.1 version of NetWare.

Dell reenters notebook fray

Intel-powered high-end line slated to ship next week

By Michael Fitzgerald

■ Dell Computer Corp. will return to the notebook market in a big way next week when it introduces what sources called a fairly strong high-end line.

The Latitude XP line of three new models will top out with a system based on Intel Corp.'s 66/100-MHz DX4 chip, a lithium ion battery and hardware-accelerated, local-bus graphics, the sources said. Other systems will use Intel's 25/75-MHz DX4 and 25/50-MHz 1486DX2.

Dell will also round out its AST Research, Inc.-supplied midrange Latitude product line. The Latitude XP line was designed by Dell but manufactured by Sony Corp., sources said.

A Dell spokesman declined to comment on the Aug. 8 announcement.

Come together

The Latitude XP launch should tighten the relationship between Dell and AST, sources said. Dell currently sells a rebadged AST notebook and now will share technology development and customer information with AST.

Users said Dell had not entirely missed the market, despite its previous stumbles.

"I would guess they'll be so careful to come out with something that's good they'll be a good candidate to look at," said Leonard Steinbach, vice president of information technology at the National League for Nursing, Inc. in New York.

"There's room for them to play in the market," said Ted Julian, an analyst at International Data Corp. in Framingham, Mass. "There's a lot of brand loyalty out there for them. They also have done a nice job of technology differentiation, such as the lithium ion battery."

More life

The lithium ion battery, expected to be the first to appear in a notebook, will give an active-matrix color notebook six hours of battery life, one source claimed. An official at a rival hardware maker said a more realistic figure is three to four hours, which is still very good.

The Latitude XP line will have only active-matrix color or passive-matrix color screens with weights ranging from 5.8 to 6.2 pounds, depending on the screen. The midrange Latitude line will have both types of screens and a low-end 33-MHz 486SX-based model with a monochrome screen.

All the notebooks except the DX4/100-based model will ship when announced. The DX4/100 system will not ship until September. Pricing was not available.

BOTH COMPANIES HAVE PARALLEL PROCESSING STRATEGIES.

BUT ONLY ONE HAS PARALLEL PROCESSING SOFTWARE.

	ORACLE7	SYBASE System 10
Parallel Processing Strategy	YES	YES
Parallel OLTP Software	YES	NO
Parallel Index Software	YES	NO
Parallel Backup	YES	NO
Platforms Supported with Parallel Software	20+	Ø

Oracle7's parallel database software makes open system computers faster and more reliable than mainframes. Call Oracle for the software. Call Sybase for the slideshow.

ORACLE

1-800-633-1071-Ext.8166

©1994 Oracle Corp

News Shorts

Upgraded IBM AIX ready to roll

IBM last week announced an Aug. 12 shipping date for AIX 4.1, the first major revision of the operating system since its 1990 debut. The release will include a built-in Common Desktop Environment, a user-friendly desktop "dashboard," installation features that reduce setup time and multithreading for IBM's forthcoming symmetrical multiprocessing Unix servers. IBM also cut pricing on AIX Version 3.2.5 by at least 40% on server licenses for groups of 64 users or more.

Thinking Machines in search of cash

Thinking Machines Corp., a pioneer of massively parallel processing, said it is running out of money and needs to find an investor or a buyer. Executives were meeting last week to try to keep the company afloat while negotiating possible deals with **Sun Microsystems, Inc.** and **AT&T Corp.**, sources said.

Message management moves forward

The **Electronic Messaging Association** (EMA) is making progress in addressing message management and file attachment issues. At its recent quarterly meeting, the EMA merged its user-driven message management committee with a vendor effort driven by **Microsoft Corp.** The resulting group plans to offer specifications in October. Also, a dozen major vendors agreed to begin immediate testing of Body Part 15, the X.400 file transfer protocol that lets disparate systems send and receive attached files.

HP to announce updated palmtop

Hewlett-Packard Co. is introducing its 200LX palmtop today. The 200LX will ship with **Lotus Development Corp.**'s 1-2-3 spreadsheet and Pocket Quicken, a specialized version of **Quicken, Inc.**'s best-selling personal finance software, as well as **Traveling Software, Inc.**'s LapLink Remote Access. The 200LX replaces the 100LX in the market and will cost $549 with 1M byte of flash memory or $699 with 2M bytes.

AT&T to offer NT management software

AT&T today will announce its StarSentry Network and Systems Management software for Microsoft's Windows NT. The system comprises a base system for NT server management from Network Managers, Inc., an AT&T Server Manager for local and remote monitoring of System 3000 servers and Microsoft's Systems Management Server for software management and remote desktop administration.

SHORT TAKES **Computer Associates International, Inc.** filed a lawsuit last week against **Baan International B.V.** charging the Netherlands-based manufacturing software developer with breach of contract. The lawsuit involves an agreement between Baan and **The ASK Group, Inc.** . . . Under terms of a settlement with the Federal Trade Commission, **Adobe Systems, Inc.** and **Aldus Corp.** have agreed to sell Aldus' FreeHand illustration software. . . . **Novell, Inc.** made an equity investment in **Integrated Systems, Inc.** and is licensing its Flexos real-time embedded operating system to the Santa Clara, Calif., firm. . . . IBM announced it will close its Kingston, N.Y., mainframe plant by the end of next year, transferring operations and 1,500 employees to a similar facility in Poughkeepsie, N.Y. . . . **Carnival Corp.** in Miami inked a $30 million contract with **AT&T** for 800 network services last week. . . . **MCI Communications Corp.** and **BT** received regulatory approval last week from the European Commission for BT's $4.3 billion, 20% investment in MCI. In June, the U.S. Department of Justice approved the plans of the two companies, which have already formed a joint venture called Concert.

Users unfazed by DEC loss

Some ponder fate of products

By Mary Brandel

Joseph Pollizzi is typical of many Digital Equipment Corp. customers. He is closely watching Digital's vital signs to gauge its future presence at his organization.

But when Digital rolled out another quarterly loss last week — $160 million before the $1.2 billion restructuring charge and $380 million write-down, "the numbers didn't faze me," said Pollizzi, a project engineer at the Space Telescope Science Institute in Baltimore.

"It's always disappointing," he said, "but the real aspect is, is Digital going to do any more [restructuring] than what they've already specified?"

Other customers concurred that last week's financials will have little to no impact on future purchases. Some said they were still encouraged by Digital's strong balance sheet, which showed little debt. Some, like Pollizzi, said they were more concerned about learning which products or services would be continued.

"I'm in a quandary as to what I can depend on," said David Sacco, MIS manager at the rolled products division of Alcan Aluminum Corp. in Cleveland. "The unknown is very disconcerting."

Digital is expected to announce its software strategy this month.

On the bright side . . .

Last week's announcement did include some good news for Digital customers (see chart).

Flat revenue from fourth-quarter 1993 "surprised everybody because the sales force was in a state of chaos," said John Jones, an analyst at Salomon Brothers, Inc.

Even better, that revenue can be attributed partly to stronger sales of Digital's Alpha AXP systems. Alpha revenue, at $400 million and 31% of total systems revenue, outstripped VAX sales, which are declining at a rate of 20% to 40%, according to Vincent Mullarkey, chief financial officer at Digital.

But even those sales came with a price: Gross margins plummeted to 25%.

Chief Executive Officer Robert Palmer promised more disciplined pricing. "We will continue leadership in price/performance, but we cannot discount products to the point of selling below cost," he said in a teleconference last week.

And the stronger sales were not enough to quell customer concern. "We may be seeing an improvement in sales, but in terms of the services they offer to me, it's still in disarray," Sacco said.

For instance, Digital said recently it would directly service only its top 1,000 accounts. "I don't know if Alcan is one of the chosen 1,000," Sacco said.

What's in store

Last week, Palmer sought to clear the air on some of Digital's intentions. In terms of future sales, the sale of part of the storage unit to Quantum Corp. "is the only major divestment that will significantly impact revenue," Palmer said.

He added that the systems integration unit was too strategic to sell. However, other pieces of Digital Consulting may well be on the block, particularly the outsourcing business, said Dataquest, Inc. in San Jose, Calif.

Palmer said he would entertain bids for semiconductor facilities, but "we're not actively trying to sell" plants.

The Multivendor Customer Services unit, which provides hardware maintenance, will see only modest cuts in the restructuring, even though total service revenue declined 7% from 1993, Palmer said.

And Palmer reiterated his promise of profitability by year's end, although he acknowledged it was an "aggressive" goal.

"We'll see how close they come," said Ed Homko, systems manager at Dr Pepper Co./The Seven-Up Co. in Dallas. "If they turn in another loss like this at the end of the year, it will lower my confidence somewhat."

Digital dilemma

Despite another whopping quarterly loss, a few bright spots appear on Digital's horizon

The Good News:

- Alpha revenue of $400 million* surpassed VAX revenue for the quarter
- Alpha and PC revenue account for 70% of total systems revenue, compared with VAX's 30%
- Product revenue is even with Q4 '93
- Alpha sales are up 54%, and PC sales are up 100% from last quarter

The Bad News:

- A $160 million quarterly loss (before restructuring), compared with $113 million net income for Q4 '93
- Gross margins fell to 25%, which is a 10% decline
- Service revenue fell 7.6% from Q4 '93
- Total revenue for the year was down 6% from fiscal '93

*Estimate from Salomon Brothers, Inc.

Digital unveils strong workstations. See page 44.

Group addresses remote LAN management

By Steve Moore

Users will come a step closer to LAN management nirvana this week if the Desktop Management Task Force (DMTF) releases its completed standards for remote hardware configuration and management.

The expected standards, called Management Information Files (MIF), are pieces of the Desktop Management Interface (DMI) introduced in October 1993. The DMI is the overall blueprint for software and hardware configuration; the MIFs are standards for specific aspects of remote management functions defined in the DMI.

MIFs are text files that can be accessed by server-based DMI-compliant applications that are needed to do jobs including software installation, license metering, performance management and trouble ticketing. The MIF for software configuration has not yet been finalized.

"For DMI to become an issue," said Mike Marburg, an analyst at Meta Group, Inc. in Reston, Va., "you need two things: server-side management applications and components that are enabled with MIFs in both the software and the hardware."

Using such applications and components, network managers will be able to determine remotely which types of hardware and software are installed on LAN-attached computers, as well as how they are configured and how well they are performing.

By the end of the year, a DMTF spokesman said, the DMTF hopes to begin a certification process. The DMTF is also expected to name additional companies that have joined its steering committee and to release a list of products that comply with its standards.

McAfee Associates pushes its own standard. See page 44.

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P O BOX 2044
MARION OHIO 43306-2144

51 Issues for $4.8

Yes, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $39.95* per year - a savings of $8.00 off the basic subscription price.

First Name ____ MI ____ Last Name ____

Title ____ Company ____

Address ____ City ____ State ____ Zip ____

Address Shown ❑ Home ❑ Business ❑ New ❑ Renew Basic Rate $48 per year

* U.S. Only. Canada $95. Mexico, Central/South America $150. Europe $295. all other countries $295. Foreign orders must be prepaid in U.S. dollars

Please complete the questions below to qualify for this special rate

1. BUSINESS/INDUSTRY (Circle one)

10 Manufacturer (other than computer)
20 Finance/Insurance/Real Estate
30 Medical/Law/Education
40 Wholesale/Retail/Trade
50 Business Service (except DP)
60 Government State/Federal/Local
65 Communications Systems/Public Utilities/ Transportation
70 Mining/Construction/Petroleum/Refining/Agric
80 Manufacturer of Computers, Computer Related Systems or Peripherals
85 Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90 Computer/Peripheral Dealer/Dist./ Related
95 Other ____ (Please Specify)

2. TITLE/FUNCTION (Circle one)

IS/MIS/DP MANAGEMENT

19 Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21 Dir./Mgr. MIS Services, Information Center
22 Dir./Mgr. Network Sys. Data/Tele Comm LAN Mgr. /PC Mgr. Tech Planning, Admin Sys.
23. Dir./Mgr. Sys. Development, Sys. Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific R&D, Tech. Mgt.
60 Sys. Integrators/VARs/Consulting Mgt.

CORPORATE MANAGEMENT

11 President, Owner/Partner, General Mgr
12 Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT

51 Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT

80 Information Centers/Libraries, Educators, Journalists, Students
90 Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase (Circle all that apply)

Operating Systems

(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

Recycled Paper

COMPUTERWORLD

E2431-X

WORKING TOGETHER TO BRIDGE OPEN SYSTEMS.

[redacted]

[illegible] 'open' was more of an [illegible] a reality. That's why the [illegible] leaders, Sun and Oracle, [illegible] 38% and 44% of their respective UNIX markets (IDC), formed dedicated cooperating teams of engineers and field consultants to ensure optimal performance of our integrated, open solutions. Both companies also make extensive use of each other's emerging technologies in running our businesses — a combined beta site of over 22,000 employees. No solution goes to market that we wouldn't rely on ourselves. For a copy of 'Oracle for Sun - An Enterprise Computing Platform' - an IDC white paper, call: **1-800-633-1071 Ext. 8160.**

ORACLE

Sun

Users see scant impact from settlement

By Stuart J. Johnston and Ed Scannell
SEDMONS, WASH

With the end of the U.S. Department of Justice's investigation, as far as Microsoft Corp. is concerned, the case is closed and the message is clear. No "Chinese wall" means full speed ahead.

The late-July settlement with the Justice Department stopped short of asking sticky questions about whether Microsoft's applications and systems divisions gain illicit competitive advantages by sharing technologies [CW, July 25]. Over the years, Microsoft executives have waffled on the issue of whether the company maintained a separation — a so-called Chinese wall — between programmers in its applications and systems divisions in order to assure third-party developers that they received information at the same time as their internal competitors.

Dave Marshak

Who cares?

Meanwhile, users are proceeding with their own systems and applications plans, fully aware of the investigation's denouement but mostly unaffected by the outcome, according to a *Computerworld* survey conducted last week (see chart).

In the survey, 85% of users, all of whom were *Computerworld* readers in organizations with at least 2,500 employees, said the outcome will not affect their plans to purchase, or not purchase, Microsoft products. Only 9% of 117 respondents said the consent decree would influence them to buy Microsoft products.

"Ho hum. That's exactly my reaction," said Bob Quick, assistant vice president and director of information technologies at Northern Life Insurance Co. in Seattle.

Yet other users saw at least a glimmer of a silver lining.

"It will make it easier for IS to standardize on the desktop," said Joe Latchaw, a computer specialist at the Department of Defense's finance and accounting systems organization in Indianapolis. "Getting applications from the operating system vendor will probably give us less headaches. I don't want to have to shop for desktop applications to mix and match with the operating system."

Additional results of the survey showed that 34% believe increased cooperation between the two divisions would improve Microsoft's products, while 27% thought it would speed those products' time to market.

Microsoft executives recently said they see nothing wrong with cross-pollination between the applications and operating system groups.

"We do not have a Chinese wall, and we do not have to provide a level playing field for other" independent software vendors, said William Neukom, Microsoft vice president of law and corporate affairs. "But we always have provided to [independent software vendors] all the information they might need."

Silence is golden

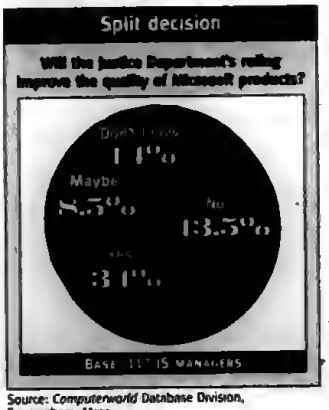
While some developers remain worried, major players such as Lotus Development Corp. were notably absent from those crying foul. Lotus and Borland International, Inc. representatives declined to comment on the settlement.

That sort of reticence on the part of leading independent software vendors may be inspired by a fear that voicing their complaints could hurt business, especially since the government refused to act. At the very least, it could create the impression that they are sore losers.

Smaller developers are not so politically correct, however.

"This settlement reminds me of the story about the elephant that was pregnant for four years and then gives birth to a mouse," said Vadim Yasinovsky, president of Clear Software, Inc. in Newton, Mass. "The settlement will change nothing as far as [applications developers] are concerned."

Perhaps not surprisingly, Mike Brown, Microsoft's vice president of finance, last week announced the company is now the leader in every major applications category. Ironically, Microsoft executives have historically trotted out the defense that the company was not the leader in any major application category in order to ward off accusations that it held a monopoly.



Source: *Computerworld* Database Division, Framingham, Mass.

In addition, the company's applications division was an early supporter of Windows, much like it was first out the door with applications for the Macintosh, said one Microsoft executive.

Senior editor William Brandel contributed to this report.

Microsoft antitrust settlement

Experts say DOJ made its best case

By Mitch Betts
WASHINGTON

The U.S. Department of Justice has taken a lot of flak for its narrow antitrust settlement with software titan Microsoft Corp., but several independent legal scholars said a broader case would have failed.

"Competitors may have wished for more, but they vastly underestimate the difficulty of winning antitrust cases in a courtroom," said William E. Kovacic, a law professor at George Mason University in Fairfax, Va.

"It is likely the government would have lost," he added, because today's generally conservative judiciary is not receptive to large-scale antitrust assaults like the earlier cases against IBM and AT&T Corp.

The big disappointment in industry circles was that the government did not require a "Chinese wall" between Microsoft's operating systems and applications development units [CW, July 25]. Another option was to force Microsoft to share information about application programming interfaces with other developers.

The sooner, the better

Even Washington's most ardent trustbuster, U.S. Sen. Howard M. Metzenbaum (D-Ohio), said he was satisfied that the Microsoft settlement was pro-consumer. "There are some other practices by Microsoft that perhaps should have been included in the settlement, such as discount tie-ins, but overall, consumers are better off that the Justice Department reached a quick settlement instead of spending years in court litigation," Metzenbaum said.

Either option would have required proving that Microsoft's MS-DOS and Windows operating systems are "essential facilities" in the PC software market and therefore must be shared with other players. But some judges are skeptical of the doctrine, which is usually applied to electric utilities and the like and is not easily proved [CW, May 16].

After extensive research, the Justice Department doubted it could legally support such a case. "It would have been a bold and risky thing to bring a case like that, and it would have been a very difficult case to win," said Stephen Caulkins, a law professor at Wayne State University in Detroit.

Moreover, those remedies would have required elaborate and perhaps intrusive regulation of the software industry. "The issues they didn't tackle are the ones that are messier to litigate and messier when it comes to writing a decree," said Warren Grimes, a professor at Southwestern University School of Law in Los Angeles.

Instead, the Justice Department took the pragmatic approach of targeting Microsoft's contracts, which were easy to attack, difficult for Microsoft to defend and quick to fix, Grimes said.

Couldn't wait any more

The department was looking for a quick fix because it knew resolution of the case was long overdue.

"We got 100% of what we would have gotten at the end of a trial and appeal. And we got it [July 16] instead of three years from now after trial and appeal," said Anne K. Bingaman, assistant attorney general for antitrust. "So that was the reason for settlement.

"The ban on the [contract] provisions we objected to most strongly — per-processor and minimum commitments — took effect immediately," she said. "That opened the market immediately, and I'm very proud of that aspect."

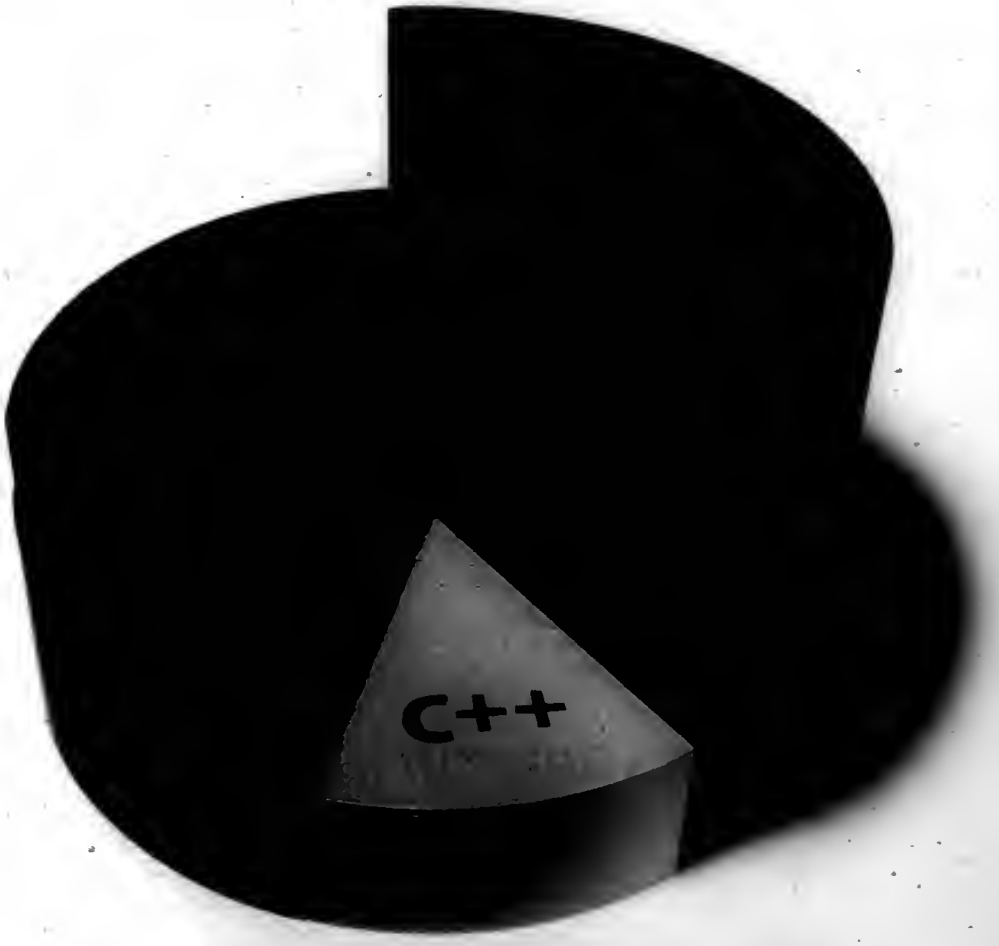
Still, the case has raised the question of whether antitrust enforcement is too slow for fast-moving industries such as software.

"Antitrust intervention is a very clumsy tool for correcting perceived problems in high-tech industries. By the time antitrust officials figure it out, the industry has already changed," Kovacic said.

Resolution of the Microsoft case, which took four-and-a-half years, was especially slow because it was stuck in the deadlocked Federal Trade Commission before being snapped up by the Justice Department.

"That was wasted time. Three years ago this consent decree might have had a real [positive] impact on OS/2 and DR-DOS," Grimes said, referring to the operating systems of Microsoft rivals IBM and Novell, Inc.

IBM sees settlement helping OS/2. See page 39.



With all the hype surrounding business programming, one thing has been conspicuously absent: the facts.

No matter how you slice it, COBOL means business programming.

According to the Gartner Group 80% of all programmers today use COBOL.

That's right, COBOL. The language that some, shall we say, "unenlightened" industry pundits think has gone the way of punch-cards and vacuum tubes. The reality is, COBOL is more vital to business today than it ever was and at Micro Focus, we know why.

Versatility—We've made COBOL the most "open" system in the industry. Micro Focus COBOL programmers can target applications to DOS, Windows, OS/2 and literally hundreds of UNIX® environments (something that current C, C++ and 4GLs only aspire to do). We've also added communications facilities and data access capabilities that make COBOL the ideal choice for developing client/server or cross-platform applications.

Performance—We've made COBOL scream. Applications written in Micro Focus COBOL run as fast as anything written in C or C++ and faster than most 4GL-based applications, too.

Productivity—We've made COBOL more productive than C, C++ and 4GLs by adding advanced tools like Animator,™ for streamlining source code debugging as well as syntax extensions to handle graphical user interfaces, file and record locking and other important functions. We've also brought the latest development facilities like Dialog System Professional,™ our rapid application development tool for Windows and OS/2® Revolve,™ our comprehensive system-wide analysis tool, and even object orientation, with our Object COBOL Option.™

Those are just a few reasons why programmers insist on Micro Focus COBOL for business application development. To learn more, call 1-800 MF COBOL and ask for our white paper: "COBOL vs. C."

Micro Focus: The past, present and future of programming.

MICRO FOCUS®

Micro Focus and Animator are registered trademarks of Micro Focus Ltd. Dialog System Professional, Revolve and Object COBOL Option are trademarks of Micro Focus. Other trademarks are property of their respective companies. Graph based on Sentry Market Research Study ADC/MS 1993-94

Changes to Internet Protocol worry users

By Saruchi Mohan
TORONTO

The Internet Engineering Task Force (IETF) last week selected the next generation of the Internet Protocol, leaving some customers wondering whether the new IP's benefits will be worth the expense and hassle.

The IP6 protocol is essentially the Simple Internet Protocol Plus with some modifications. IP6 provides features many users have been clamoring for, including more IP addresses, easier configuration and better security.

But the price is high for users who will essentially have to upgrade their entire router installations. Customers have two choices: either run both the old and new IP stacks together in routers or put in gateways to translate between the old and the new.

"Transition will be a challenge," said Bob Moskowitz, a software support specialist at Chrysler Corp. in Detroit.

It is this uncertainty that has left David Pensak, principal consultant for advanced computing technology at Du Pont Co. in Wilmington, Del., "terrified" at the prospect of moving the chemical giant's 4,000 IP-networked computers to the new protocol.

Patching it up

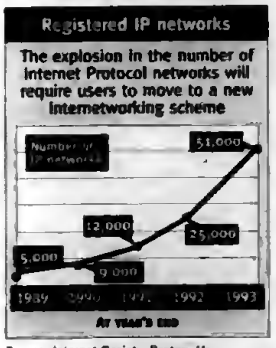
Many attendees wondered aloud if patches to IP4 would not have done what IP6 promises. Bob Moskowitz, Chrysler support specialist, didn't think that would make life any easier for the administrator, who would then have to deal with every incremental change as it came along.

Expecting the worse

"We expect everything to break and [there being] absolute chaos for a long time," Pensak said. "If we have to physically change and then test 4,000 machines, this is going to be the biggest problem since the bubonic plague." Pensak, however, did applaud the decision and said he hoped to see vendors implement the protocol so it works.

Translations are a no-win deal for one administrator, who asked not to be identified, at an aerospace company that uses tens of thousands of IP addresses. If the translations do not work, they will generate a huge legacy system. If they do work, "we have a routing problem. Our backbone network handles five protocols, and handling yet another is too much to ask," the administrator said.

For Brian Carpenter, group leader of communications systems at CERN, a research laboratory in Geneva, the decision to transition would have to be based on a cost/benefit analysis.



Source: Internet Society, Reston, Va.

Big change

The IETF is certainly aware of the magnitude of the transition issue. "There's been a huge amount of thinking on migration," said Allison Mankin, a co-area director. Two working groups are currently deliberating on long- and short-term migration strategies, she said.

Apart from the physical transition problems, some users are skeptical about the value of the new version. If IP6 enables networks to become secure with Plug and Play support for audio, video and other high bandwidth applications, it will be a tremendous help, the aerospace user said. If it is only slightly different, there will be "a strong disincentive to deploy it, even if the Internet requires it," the user said.

In any case, customers have some time to think about the issues and to plan how they will get there, if at all. Products are not expected from vendors for at least three years.

Senior editor Gary H. Anthes contributed to this story.

Point-to-Point Protocol smooths path to ISDN. See page 50.

Banyan invades enterprise server territory

By Elisabeth Horwitt

After languishing for years as a network operating system also-ran, Banyan Systems, Inc. seems on the verge of taking the lion's share of the enterprise network services market. Strong second-quarter results and several major new customer contracts are evidence that the company's strategy of platform-independent network services is paying off, analysts said last week.

"I was very positive on Banyan even before [last week's second-quarter] results," said Marty Palka, a principal analyst at Dataquest, Inc. in San Jose, Calif. "I believe they are leaders in evolving from a network operating system to a network services provider, and that they have a technological lead of approximately two years over their competitors."

Crucial to success

Key to Banyan's continued growth is the delivery of promised products over the next few months. Banyan is expected this week to announce its long-awaited Windows-based network management system, which is based on the Windows version of Hewlett-Packard Co.'s OpenView. The product will include applications for managing various Enterprise Network Services and devices, a source close to HP said.

And in August, Banyan plans to ship Intelligent Messaging III, a version of its messaging back end that will be integrated with its recently acquired front-end messaging product, BeyondMail 2.0.

Right now, Banyan is the only major vendor to meet a growing corporate need for an integrated set of enterprise services, including naming, directory, messaging and security, across a broad range of systems platforms, analysts and users said. Novell, Inc. is expected to ship its first viable offering, NetWare 4.1, by year's end, while Microsoft Corp. is not expected to begin shipping directory services for Windows NT 3.5, code-named Daytona, until next year at the earliest.

Companies such as GTE Telephone Operations with immediate needs for enterprisewide network services see Banyan as the only choice. The Irvine, Texas-based GTE Corp. subsidiary recently signed a contract with Banyan for a 30,000-seat network that will include Vines; Enterprise Network Services for HP/UX and The Santa Cruz Operation's SCO Unix; and BeyondMail.

"We're making a major change from an office automation LAN environment" to one that will support mission-critical applications, including distributed databases, that will link users across 40 states, said John Miller, director of office systems and telecommunications at GTE Telephone. "We looked at everyone, and at this time, the only answer in the marketplace was Banyan."

Indeed, user demand for Enterprise Network Services is beginning to take off, driven by the proliferation of enterprisewide PC-based networks and groupware and message-enabled applications that need an enterprise directory, Palka said.

As continuing evidence of its growing market and financial prowess, Banyan last week announced strong second-quarter earnings, including a 28% increase in software revenue and a 51% increase in overseas business, compared with the same quarter last year. Banyan added 460,000 seats in the second quarter alone, according to Peter Hamilton, Banyan president and chief operating officer.

Banyan's recent acquisition of Beyond, Inc. is also beginning to pay off, Hamilton reported. Revenue for BeyondMail grew more than 100% in the second quarter, compared with the same quarter last year when Beyond was a separate company, he added.

Gaining ground

Banyan's relatively small share of the overall network operating system market, totaling 275,000+ licenses among top vendors, leaped substantially at large user sites

Novell	68% market share	188,000 licenses
Banyan	8% market share	22,100 licenses

Novell	50% market share	19,000 licenses
Banyan	49% market share	18,000 licenses

Source: Dataquest, Inc., San Jose, Calif.

LAN outsourcing vendors lose sight of users' needs. See page 43.

New exec onboard

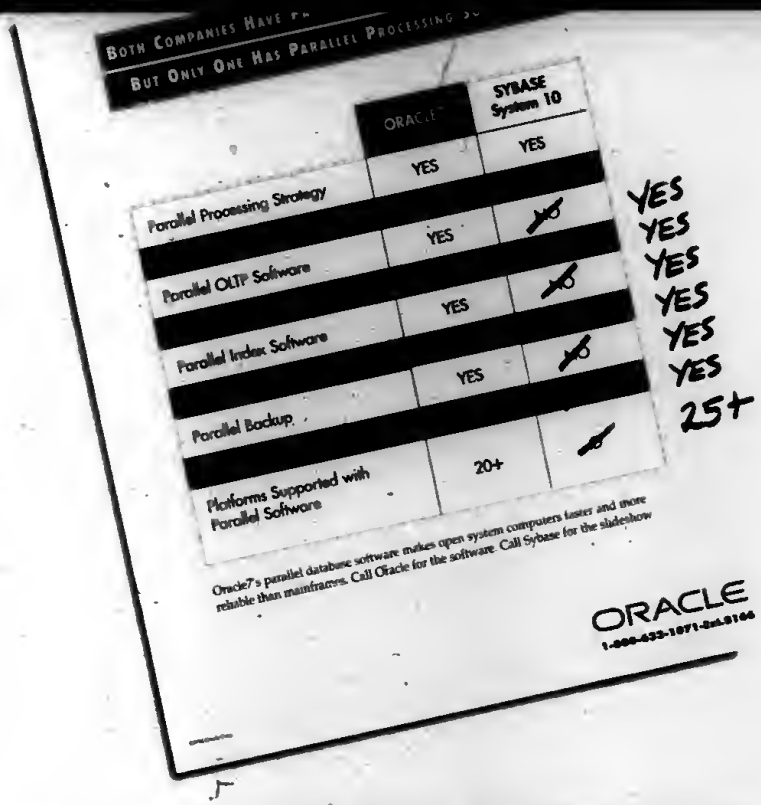
John M. Paul *will fill new Banyan position*

Looking for seasoned help in its push into the systems software market, Banyan last week hired John M. Paul, former head of Compaq Computer Corp.'s systems software organization, for the newly created position of senior vice president of product development.

"The biggest strength I bring is to help Banyan execute their strategy at a rate that exceeds their current goals," Paul said.

At Compaq, Paul was responsible for integrating operating systems into hardware platforms. There he masterminded SmartStart software, which automates the configuration of Compaq PCs. Also, as a founding member of the Open Software Foundation, Paul largely directed the development of Motif as an industry standard in about seven months, Paul said. —*Elisabeth Horwitt.*

"ALL THIS TALK ABOUT PARALLEL AND THEY STILL CAN'T GET IT STRAIGHT."



PARALLEL ISN'T THE ISSUE, PERFORMANCE IS.

Sybase supports thousands of simultaneous users running mission critical applications–with only a fraction of the hardware Oracle requires. In fact, Sybase's price/performance beats that of *any* vendor on *any* platform in TPC/C benchmarks–a true client/server benchmark for OLTP and decision support. No wonder Oracle hasn't even attempted it. So you can see why 86 out of the top 100 Fortune '500' companies have chosen Sybase.

For the truth about Sybase's price/performance leadership, call us for the TPC/C benchmark results. 1-800-SYBASE-1, ext. 6010.

SYBASE

PEOPLE BET THEIR BUSINESS ON US.

Outside the U.S., call (510) 384-8044 ©1994 Sybase, Inc. Original Oracle ad ©1994 Oracle Corporation, reproduced from 7/11/94 issue of Computerworld. Fortune is a trademark of Time Inc. Other company and product names may be trademarks of their respective owners. System 10™ acquire SYBASE navigator Server™ is now and available Q4 1994.

It's a VisualAge at Object World

By Kim S. Nash
SAN FRANCISCO

IBM previewed two object-oriented development technologies that build on its VisualAge object generator at Object World here last week.

OBJ Chart, a tool to model objects, and VisualBuilder for C++, an application generator, are not yet full-fledged products, but the demonstration "shows where we're headed," said Steve Mills, general manager at IBM's Software Solotions division. The prodnets should he ready by year's end, IBM executives said.

IBM also anounced that Windows versions of its VisualAge object-oriented development tool kit and a Windows version of IBM's Smalltalk programming language have entered beta testing. General availability of the products is slated for the fall, Mills said.

"Smalltalk is crucial to ns so we're quite glad to get it" on Windows, said Calvin Opitz, vice president of Global Electronic Markets, Inc. in Wellesley, Mass.

But IBM's promise that applications generated under OS/2 will he portable to Windows "is eveo more interesting," Opitz said. Global Electronics has yet to choose target platforms for a combination text/visual documentatioo application it is huilding, so the ability to run under OS/2 or Windows gives the firm more freedom, he explained.

Moreover, VisualAge, which runs on OS/2 and AIX, "is about to move ooto" Microsoft Corp.'s latest version of Windows, code-named Chicago, and Taligent, Inc.'s operating systems, Mills said.

For more Object World announcements, see page 59.

Five companies were honored last week at Object World *in San Francisco during the* Computerworld *Object Application Awards Program. Pictured are (from bottom left to right): Wolter Ringger and Daniel Schelz, IBM Switzerland; Greg Smith, Boeing Defense & Space Group; Steve Mills, IBM. From top left to right: Carl Webster, Naval Computer & Telecommunications; Bill Hoffman, Object World Expositions; John Wiley, David Pett and Tom Weber, all from Pacific Bell; Steve Jobs, Next Computer, Inc.; Gary Beach,* Computerworld *publisher; Mike Baker, Caterpillar, Inc.; Mike Shumate, Naval Computer; Cor DeGroot, IBM Switzerland.*

Prebuilt applications assist in workflow

By Lynda Radosevich

In an attempt to seed the workflow market, Action Technologies, inc. in Alameda, Calif., said it will ship this week a cheaper, easier-to-use version of its workflow engine for Lotus Development Corp.'s Notes.

Action Workflow Manager for Lotus Notes now costs $199 per user for 10 nsers, down from $650 per user. It ships with ready-to-use workflow applications for to-do lists, meeting planning and action-item management.

For Babson College in Wellesley, Mass., the prebuilt applications are "fantastic because what we put into our [workflow] design calls for those capabilities," Chief Information Officer Richard Kesner said. He is leading Babson's schoolwide project to rework student services such as financial aid using Notes, Action Workflow Manager and Microsoft Corp.'s SQL Server. "We were going to build the [workflow applications] in Visual Basic, but I prefer to go right ont of the wrapper because life is too short to spend programming," Kesoer said.

Analysts said most users would probably use the prebuilt applications to get their feet wet and then create custom applications.

Action's nearest competitor, Reach Software Corp. in Sunnyvale, Calif., charges roughly $300 per user for 10 users for its Notes workflow product. But even with its price advantage, Action faces an nphill battle in jump-starting its version in the workflow market.

Bruce Silver, an analyst at BIS Strategic Decisions in Norwell, Mass., said most firms will not pay $200 per user for nonstrategic workflow antomation projects.

UK bank launches workflow winner. See page 46.

High bids to raise narrow-band costs

By Michael Fitzgerald

The unexpected hidding war at last week's auction for narrow-band Personal Communications Services (PCS) licenses could mean higher prices for users and less competition in the cellular industry.

Prices for the t0 narrow-band liceoses up for sale had hit more than $50 million each by the end of Wednesday, and bidding continued through press time. Observers had expected the auction to fetch $50 million total.

Big bucks

The high prices suggest that narrow-band networks will cost significantly more to build than was initially expected. This could mean higher service charges for the new features these networks will offer, such as two-way paging, voice messaging and acknowledgment paging, which lets users know that a page has been received.

In addition, it could mean higher prices for broadband PCS licenses later this year, forcing cellular vendors to consolidate, observers said. Last week, for example, US West and AirTouch Communications agreed to merge their cellular operations.

Ultimately, some promising technologies could be lost, as evidenced by AT&T Corp.'s decision last week to close down EO, inc., which had an interesting product concept but little market penetration, according to analysts.

"I see the consolidation as a two-edged sword," said Lee Nolan, senior telecommunications engineer at Travelers Insurance Co. in Hartford, Conn. "When you have nothing but big players in that scene, they understand the importance of things like roaming, where sometimes smaller players are concerned with only their area. The bad news is, it'll be ... more expensive" — at least initially.

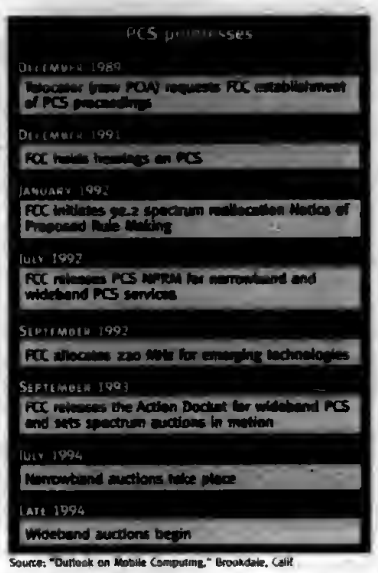
"There's a correlation between license prices and user prices. Somehow vendors have to recoup their costs," said Roberta Wiggins, an analyst at The Yankee Group in Boston.

"To justify a bid of $70 million, not counting the cost of oetwork build-out or interest, a wireless provider would need 194,000 customers paying around $29.99 per month," said Timothy J. Schmidt, director of mobile computing at Probe Research, Inc. in Orlando, Fla. Some paging vendors do have more than 500,000 customers.

In the meantime, users welcomed the potential for new paging services that the narrow-band PCS auction portends.

"It amazes me how people have to keep in touch these days. So the better the paging capabilities, the better you can keep your business in touch," said Stanley Dobrowski, data center manager at Bergen County Utilities Authority in Little Ferry, N.J. Dobrowski called the inability of current pagers to verify receipt of messages a "severe deficiency."

Senior editor Ellis Booker contributed to this story.



Source: "Outlook on Mobile Computing," Brookdale, Calif.

Best intentions

In a major affirmative action effort, the federal government established rules to allow minority and women-owned firms to acquire PCS licenses for 25% less than the top bids, but the bidding frenzy that has marked the PCS auction may shut most or all of those firms out of the market entirely.

Native Microsoft suite coming for Power Mac

By Mark Halper

By early September, users of Apple Computer, Inc.'s Power Macintosh will be able to buy something many have been waiting for since the machine's March introduction: a native version of Microsoft Corp.'s Excel spreadsheet.

Power Macintosh versions of Microsoft's Word program for word processing and its PowerPoint presentation application will follow a month later in early October, Microsoft product manager Don Pickens said last week.

Together, the three programs form the Microsoft Office suite, which Microsoft will begin offering in incomplete packages in September, Pickens said. Those packages will include coupons entitling the users to Word and PowerPoint when they become available, he said.

Office envy

The Power Macintosh version of Microsoft Office will arrive to find a loyal following already in place among 68000-based Macintosh users

OFFICE (LICENSES SHIPPED)		
Windows	2.1 million	64.8%
Macintosh	300,000	100%

Source: Dataquest, Inc., San Jose, Calif

In a move well received by some users, Microsoft said it is packaging separate Microsoft Office 4.2 versions for 68000-based Macintoshes and for newer Power-PC-based Power Macintoshes, all in one shrink-wrapped box.

"That's good because as we upgrade individual machines, we don't have to buy new software," said Todd Nugent, director of information services at Chapman and Cutler, a Chicago-based law firm. The firm eventually plans to upgrade about 600 older Macintoshes to the PowerPC-based Power Macintoshes.

Two-for-one ups ante

Users pointed out that the two-for-one packaging is probably one reason why Microsoft priced the forthcoming Microsoft Office 4.2 for Macintosh on the high side. Pickens said the "estimated retail price" will be $499 for a new user or $259 after a $40 rebate for an upgrade. Microsoft recommends a minimum of 8M bytes of RAM to run Office 4.2 for Macintosh.

Individual applications will sell on the retail level for $399 new or $99 after a $30 rebate on upgrades, he said. The rebates are in effect until Dec. 31.

"We're happy for any compassion we get from Microsoft," Nugent said, referring to the rebate. He characterized the pricing as "still a little steep" but said prices are more reasonable than the last time Microsoft upgraded Office for Macintosh.

Mel Gilbert, a real estate agent at Re/Max Professional Realty, Inc. in Lionville, Pa., agreed. "It's a little more pricey than I would like, but to get that quality of software, you might have to pay that much," he said.

Re/Max Professional Realty is a beta site for the forthcoming version of PowerPoint 4.0, which is part of Office 4.2. Gilbert, who is running PowerPoint on a 68040-based Macintosh, praised it for new features such as Object Linking and Embedding (OLE)-driven cutting and pasting, which permits him to easily insert information from Excel into a PowerPoint presentation program.

OLE is Microsoft's object-based document management technology, which permits users to swap pieces of applications in and out of other applications.

Microsoft touted other advancements in Office 4.2 for Macintosh last week, including the following:

- Improved "intelliSense" technology that anticipates user action and automatically corrects spelling errors.
- Improved scripting support, which allows information systems managers to automate loading and reconfiguration procedures for a Macintosh shop.

GENERAL INSTRUMENT

Invites

Software Applications Developers

To Participate In The Future

Of Interactive Multimedia Cable Technology

Philadelphia, PA • August 30-31, 1994

Learn how you can participate in this exciting new world of interactive multimedia. Specifically:

- Writing applications compatible with GI's interactive set-top platform, code named LinX™
- Participating as a developer
- Working with the applications development process for interactive TVs and PCs
- Creating toolkits

If you develop applications, content or interactive services for broadband networks, you can't afford to miss this valuable meeting.

For more information, call 1-800-353-6684.

GI General Instrument

Leading The World In Broadband Technologies

IBM

CONTINUED FROM PAGE 1

that customers who buy the CMOS hardware must upgrade to the latest release of MVS/ESA and related system software.

The upcoming models, positioned as stand-alone general-purpose mainframes, should be useful to a wider range of customers than the more specialized parallel transaction and query engines that IBM introduced in April. Those typically must be linked to ES/9000 511 and 711 series processors, which IBM acknowledges make up only 15% to 20% of the installed base.

Coming this fall

Carl Greiner, an analyst at Meta Group, Inc. in Westport, Conn., said IBM is moving toward a September introduction of the general-purpose CMOS mainframes, with shipments starting before year's end. IBM declined to comment on its plans.

While the new systems will run only a single copy of MVS — and therefore be unable to take full advantage of the CMOS hardware's parallel processing and data-sharing capabilities — users and analysts said this should provide a good starting point for shops eager to begin the migration trek.

Paul Quade, director of capital planning and resource management at Galileo International, an on-line reservation consortium in Englewood, Colo., agreed that supporting earlier software on the parallel hardware will broaden the appeal of those machines. "IBM will widen its market," he said. "A lot of people who are running older software don't want to change that."

Costly upgrade

Beech Aircraft, for example, currently runs MVS/ESA 4.3 on a pair of 3090 Model 400E mainframes but would have to buy more recent hardware to go to MVS/ESA 5.1, Duntz said.

"I have no reason not to stay where I am, and in fact, I need to stay where I am to support the hardware I have now," he added. The ability to run earlier software releases on the CMOS-based hardware would eliminate that problem and "allow us to look at it as a general-purpose mainframe," Duntz said.

He said he also expects IBM to offer lower entry-level pricing than the $25,000 to $27,000 per MIPS it charges for the current parallel System/390 machines.

Duotz said Beech eventually would like to see full parallel hooks built into the earlier MVS releases so they can run in a parallel sysplex installation. But IBM has not yet committed to do that, he said.

How it works

The single-image general-purpose system is expected to consist of six 13-MIPS processors that could run individual jobs or gang op to provide modest parallel capabilities.

The 13-MIPS performance roughly equals the power only of IBM's old 3080-class boxes, but the machine "will make it easier for customers to get ready to move to the new world," Greiner said. "You can bring it over slowly and start getting some benefit. It pots you on the price curve of CMOS."

CMOS R Us

Support for running older software on the CMOS-based System/390 hardware would provide the following benefits:

- ▶ Enable a much wider group of customers to use the CMOS technology.
- ▶ Let users run in single-image mode without upgrading to MVS/ESA 5.1.
- ▶ Eliminate the need to upgrade to latest releases of CICS and IMS.
- ▶ Eliminate the need to buy coupling facility for parallel sysplex environments.
- ▶ Provide a better growth path than 9221 air-cooled models.

IBM already offers general-purpose CMOS mainframes as part of its air-cooled 9221 series. However, those are rack-mount models for smaller shops, while the upcoming systems should be "a better long-term investment" because they will use the same cabinets as the full parallel machines, said Charlie Burns, an analyst at Gartner Group, Inc. in Stamford, Conn.

IBM has been running earlier versions of MVS on the CMOS hardware in its labs but shied away from supporting them before to protect the demand for traditional ES/9000s, which are based on emitter-coupled logic (ECL) technology and have higher prices and profit margins, Burns said.

"Clearly, IBM's first approach is not to bleed business away from the ECL machines on which they make more money," he said. "If you're a businessman, you can't fault that. The only problem is, by doing that, they kind of short-cut their ability to succeed long-term" with the CMOS-based systems.

The CMOS performance should improve significantly during the next two years, starting with a 25-MIPS processor due out in mid-1995, analysts noted.

Net management

CONTINUED FROM PAGE 1

products that vendors can offer, "the trick is to get those products to communicate with each other," said Jim Moorhouse, manager of network management strategies at Motorola, Inc. "That's where we need a manager-to-manager communications standard."

Unfortunately, ever since IBM began enhancing the original OpenView code, which is the basis of NetView/6000, the two companies and their systems, have barely spoken to each other. This is hurting users.

American Cyanamid, for example, has two divisions using OpenView and another using NetView/6000. It wants users to be able to manage its networks using either platform as a focal point, said Gil Irizarry, a network manager at the Clifton, N.J., chemical firm.

This would "allow you to manage my resource if I'm not available or vice versa. Then our help desk groups could learn how to back each other up when necessary," Irizarry said.

Anxious users

On the plus side, many customers are eager to get their hands on distributed management systems that IBM, HP and Sun Microsystems, Inc. are rolling out. If a company has 10,000-plus workstations, using a centralized Simple Network Management Protocol (SNMP)-based polling system such as IBM's NetView/6000 "is a real problem" because of the overhead, said Rich Kuzman, vice president of telecommunications operations at Fidelity Investment Co.'s communications division.

The ideal, Kuzman said, would be for central information systems to collect alerts across the enterprise and then notify the appropriate managers, who could diagnose the problem locally.

Both IBM's and HP's upcoming introductions provide some degree of distribution within their own platforms through commercial distributed SQL database products from companies such as Oracle Corp. and Sybase, Inc. The idea is to have local management nodes collect configuration and alert data about their particular domains and then allow users and applications to do queries as if the distributed nodes were one database.

For example, an inventory management application would be able to query the distributed database for information on the location of all routers or all OS/2 PCs. Alternatively, a network manager could track a problem to its source by collecting traffic and error data from several types of devices and several locations.

Some precautions

However, providing a common SQL storage bin for network management does not automatically ensure that applications can actually access one another's data, said David Passmore, president of Decisis, Inc., a Herndon, Va., consultancy. Platform and application vendors also need to agree on common specifications for representing and modeling the management data, he said.

HP plans in the second half of 1995 to introduce a data repository with common object definitions. This will enable OpenView applications to share data, an HP spokesman said. However, there is no industrywide effort to provide such definitions across network management platforms, he added.

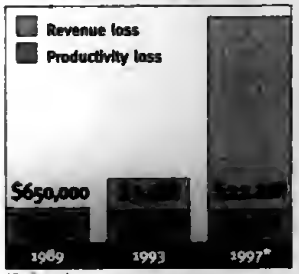
On a more positive note, Sun, HP and IBM platforms should at least be able to exchange alerts and alarms sometime next year through common support of the SNMP Version 2 Manager-to-Manager protocol.

Failed effort

A group of application vendors formed the Management Integration Consortium last fall with the hope of creating an industrywide database standard. However, that group has lost steam, analysts and vendor spokesmen said.

Slippery slope

The costs of network downtime to business users because of LAN and server outages are expected to increase as network systems proliferate in the next three years



*Projected

Source: Infonetics Research, Inc.

Distributing the management load

In the "watch this space" department, major network management vendors are expected to announce the following:

- Sun is expected by year's end to introduce Encompass, the distributed version of BunNet Manager that will be based on NetLabs, Inc.'s 3G Dimons. The product will have a distributed, object-oriented repository for managing network devices, connections and applications, a spokesman said.
- Sun, IBM and Hewlett-Packard are expected by year's end to provide software that intelligently correlates multiple alerts to identify the source of a problem. Sun and HP will use NetLabs' technology; IBM is enhancing its existing offering.
- IBM has plans to enhance the interaction between mainframe and RS/6000 versions of NetView. This will allow users to manage mainframes and AIX-based systems "as a single entity" by integrating the object data structures of both versions, according to Sanjiv Ahuja, IBM's director of network management platforms.
- HP is preparing to provide mainframe management for OpenView via applications jointly developed with Legent Corp. OpenView currently manages SNA via Peregrine Systems, Inc.'s OpenSNA application.

— Elisabeth Horwitt and Steve Moore

Two Strategies for Client/Server Applications Development

Both in One Software...the SAS® System

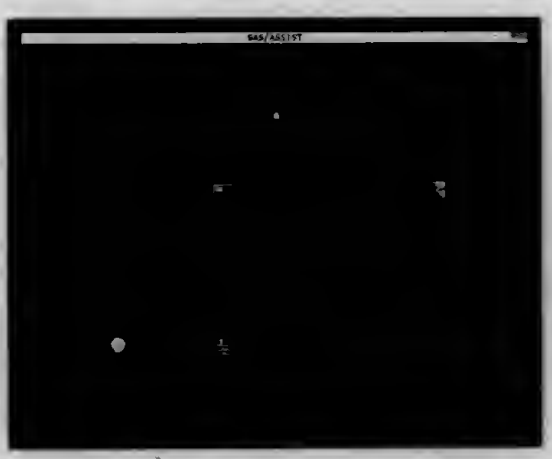
Only the world's leading information delivery system gives you two proven strategies for satisfying today's client/server applications development needs:

Empower Your User Community

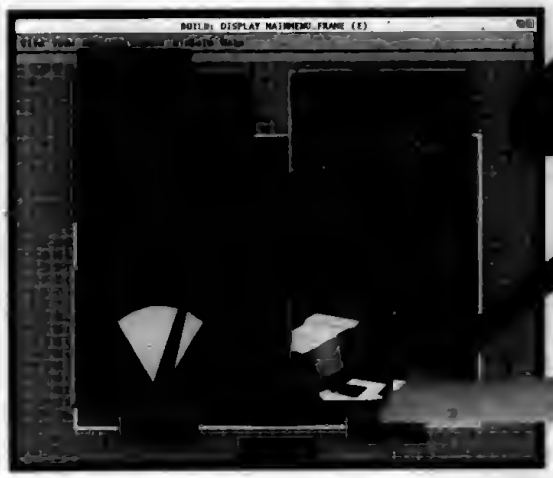
1

The SAS System offers a secure and manageable environment for making enterprise data available on demand. And for turning that data into useful business information for strategic decision making.

Through an intuitive, dynamic, and data-driven interface, even novice business users can handle the most sophisticated requests by themselves: ad hoc queries, reports, business graphs, forecasts, analyses, and more. By making the SAS System your standard for end user access and reporting, you'll empower users to satisfy their own information requests.



Empower Your Applications Developers



2

With more self-reliant end users, developers are free to concentrate on implementing client/server applications critical to your business. Here, too, the SAS System satisfies your most demanding requirements by supporting an *iterative* approach to rapid applications development. Put strategic business systems in production quickly... even as you continue to develop and enhance them.

Object-oriented tools simplify and speed development. And support for multiple client/server models (including distributing application logic to the processor best equipped for the task) provides a flexibility unrivaled by "client only" development tools. What's more, the SAS System's portable architecture means applications look and run the same no matter where you deploy them, desktop to data center, preserving your applications investment over the long haul.

Take a Minute Now to Take Years Off Your Development Cycles

With the SAS System, you'll improve business processes rather than just automating them. Users become more independent, developers more productive, and applications more valuable...today and tomorrow. For a closer look at the SAS System—and to find out how to receive these applications development tools for a free evaluation—just give us a call at **919-677-8200.**

SAS Institute Inc.
Sales and Marketing Division
Phone 919-677-8200 ☐ Fax 919-677-8123
In Canada: Phone 1-800-363-8397

SAS is a registered trademark of SAS Institute Inc. Copyright © 1994 by SAS Institute Inc.

If you want a pow
you've got a tough decision.
But if you want powerful database
users, it gets pretty easy.

What's the difference between apples and oranges? In this case, it's the difference between powerful features and powerful features your users can actually use.

Introducing Lotus Approach Release 3.0.

In 1983, Lotus® introduced the world's first approachable spreadsheet. Now we introduce a truly powerful database that's as easy as 1-2-3.® So easy that *PC Computing*, July 1994, calls it "The Amazing Code-Free Database."†

Lotus NOTES READY

Now you don't have to be a programmer, or even think like one, to build a relational database that brings real efficiency to your work.

$495 suggested retail price. $129 special price expires Dec. 31, 1994 **$299 SmartSuite upgrade promotional price available while supplies last. In Canada call 1-800-GO-LOTUS ©1994 Lotus Development Corporation, 55 Cambridge
Access is a registered trademark and Windows is a trademark of Microsoft Corporation. dBase is a registered trademark of Borland

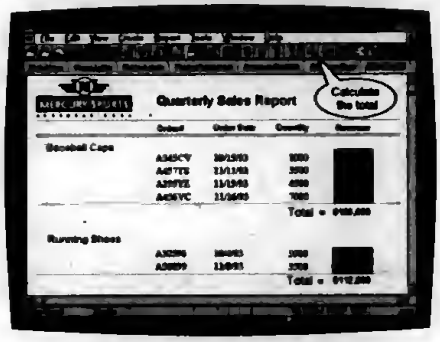
With the new Approach® 3.0, demanding functions like tracking sales, managing projects, taking orders, invoicing, managing contacts and analyzing and reporting data are surprisingly simple.

Over 200 new usability and power features will take even the most overworked skeptic to productive database-user-for-life in two hours.* Don't doubt it. There's a good reason why Approach is the fastest-growing database in the business.

Easy as 1-2-3.

Lotus Approach is the only database with PowerClick™ reporting, letting users see and alter reports as they are building them. Just click on the intuitive SmartIcons® to organize and calculate data. And, the friendly on-line Assistants help to design reports, forms, mailings, analyses and more. Compared to Microsoft Access,® well there's no comparison. As *Infoworld* recently commented, "Approach (3.0) looks like a better choice than Microsoft Access (2.0): easier to use, yet still fast and powerful."††

Constructing a report in Access. "Easy"?



Constructing the same report in Approach. Easy.

And Approach 3.0 extends the power of Lotus 1-2-3 allowing users to create intelligent forms, PowerClick reports, mailing labels, and dynamic crosstabs on their worksheet without ever leaving 1-2-3.

Approach X10™ query technology delivers blazing speed in organizing, analyzing and manipulating databases. And, Approach provides the highest performance connectivity to virtually any database, from dBase® to Access, to Lotus Notes® and more. Plus Approach includes a powerful new macro capability for sophisticated application development.

And its advanced integration with Lotus Notes, the leading groupware application, makes it the obvious choice for people who work together in groups.

Only Lotus Approach 3.0 gives you:

- *PowerClick reportwriter (for WYSIWYG design)*
- *InfoBox (instant on-screen manipulation)*
- *Smart Assistants (to guide you)*
- *PowerKey™ technology (for direct access to existing data)*
- *Lotus 1-2-3 Integration (for working with 1-2-3)*
- *Lotus Notes Integration (for reporting on Notes data)*
- *X10 speed architecture (for blazing speed)*
- *Dynamic crosstabs (for drag and drop analysis)*

$129 Special Introductory Price.

Lotus Approach is one of five Windows™ applications that make up Lotus SmartSuite.® Look into it while a SmartSuite upgrade costs just $299.** Call **1-800-TRADE-UP, ext. 9963** for more information.

Lotus
Working Together

Parkway, Cambridge, MA 02142 Lotus, Lotus Notes, 1-2-3, Approach, SmartSuite, SmartIcons and Working Together are registered trademarks and PowerClick, X10 and PowerKey are trademarks of Lotus Development Corporation International Inc. *MarketProbe International, New York, NY, February, 1993 †*PC Computing*, July, 1994 ††*Infoworld*, April 4, 1994

GUIs

CONTINUED FROM PAGE 1

On average, training and support for GUI-based software costs $1,300 to 1,500 per user per year, according to Priscilla Tate, executive vice president at Technology Managers Forum in New York. These costs will accrue as more graphical complexities are delivered.

"The biggest single complaint I have is that the icons are not as obvious as the designers apparently think they are," said Bill Murray, director of IS and strategic technology at Tribune Broadcasting Co. in Chicago.

For example, WordPerfect Corp.'s recently shipped WordPerfect for Windows 6.0a features 45 icons and buttons. One cryptic icon, a capital L with triangles next to it, represents a tab set. In Lotus Development Corp.'s Notes, one SmartIcon appears as a black star against a yellow page; when pressed, the pop-up dialog box reads "Scan Unread."

Ineffective software

The major software vendors acknowledge that PC software is so overfeatured and nonintuitive that it does not meet users' needs. Noting PC software's shortcomings in his Windows World keynote address, John Edwards, an executive vice president at Novell, Inc., cited a Novell study that indicates PCs now hold only 5% of the information employees use to perform their jobs each day.

Yet even as vendors acknowledge this, their solution to each complexity has been to market something more complex to address it.

For example, Microsoft's Windows World booth distributed position papers claiming that end users in its test laboratories were 10 times more productive with Chicago than Windows 3.1. On the other side of the booth, the company demonstrated a new "start" feature in Chicago that illustrates how difficult it is for end users to navigate through all of Windows' features.

The start button, located on the task bar (relocated to the bottom of the screen in the demo), returns users to where they originally began a task.

"That start button is sort of like the F1 key on a dumb terminal," said Kirk Ostby, manager of production services at Indiana Farmers Mutual Insurance Group in Indianapolis. His company has yet to move to Windows, Ostby said, partly because the insurer is not convinced Windows would make its users more productive.

"We probably will move to Chicago when Version 4.1 comes out, if we can configure the GUI so that it is helpful in [the Windows] environment," Ostby said.

Users and vendors agreed that too much technology is being thrown at customers. That usability problem will only become more severe as GUIs lift their focus from desktop application to groupware, analysts said.

Vendors contend they are scurrying to address the clutter issue. Microsoft, for example, has hired anthropologists to study how end users accomplish group tasks.

Developers at Microsoft are now required to participate in usability studies on how end users — not developers — do tasks.

Not surprisingly, the dominant application suite in the market, Microsoft's Office, scores the highest in usability studies conducted by National Software Testing Laboratories in King of Prussia, Pa.

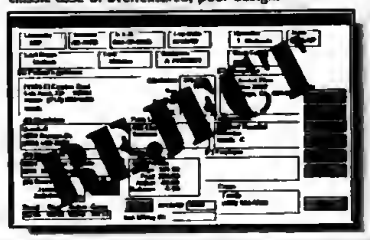
"There's been a tremendous amount of evolution targeting the interface toward more experienced users," said Mussie Shore, a chief designer at Lotus. "But there has been very little done to address new users."

Meanwhile, as the current bunch of applications duke it out for the usability crown, vendors are preparing to launch a new onslaught of Chicago-based applications, making the complexity factor even worse.

"The good news is Chicago should be more intuitive," Tate said. "The bad news is that a new intuitive interface will ultimately require more training."

Good GUI meets bad GUI

A limited set of features helps make the GUI above more intuitive, while the cluttered screen below is a classic case of overfeatured, poor design.



Source: Corporate Computing, Inc., Bannockburn, Ill

Net utility eases LAN file sharing

By Lynda Radosevich

Many information services professionals are fond of the file-sharing, workgroup-enhancing capabilities of LANs but have yet to find an affordable way to make it easy for end users to share files and navigate network drives.

To alleviate pieces of this LAN problem, analysts said they expect to see more products like the one Mountain View, Calif., start-up First Floor, Inc. recently announced.

First Floor recently began shipping Network Central, a $99.95 graphical network utility that lets end users keep related documents from multiple PC and network drives together in a metaphorical folder.

An easier path

Other users who have been granted permission can access the folder and work on the files. The files stay put, but they appear as if they are on the users' individual desktops. The benefit is that users do not need to know complex network paths such as M:\budget\q4\accounting.

Network utilities are likely to find a niche because current software packages such as Lotus Development Corp.'s Notes and document management systems are expensive and "not so easy to use," said Stuart Dickerson, an MIS analyst at Oglethorpe Power Corp. in Atlanta. He added that a utility such as First Floor's could help fill a short-term file navigation and sharing need.

"The problem for end users is managing all the information they have access to," he said. The utility company had used Digital Equipment Corp.'s All-in-1, which employs an easy-to-use folder metaphor. Now the utility is using Novell, Inc.'s NetWare networks and would like to find a similarly robust workgroup setup.

"But they are so expensive now that we're looking for an interim workgroup solution until competition adds more products and lowers prices," Dickerson said.

Compounding the network file management problems are larger, cheaper hard disks that allow users to stockpile more files on their own PC and on the network, analysts said.

Users demand answers to GUI tool problems

By Thomas Hoffman
JERSEY CITY, N.J.

■ More than 200 Oracle Corp. users jammed a conference room here last week to lob questions about support and product features at representatives from six of the leading graphical user interface (GUI) front-end tool developers.

Most attendees viewed the session — dubbed "The Great GUI Day" — as an opportunity to familiarize themselves with the latest offerings from Oracle, Powersoft Corp., Microsoft Corp., Gupta Corp., Uniface Corp. and KnowledgeWare, Inc.

"It's a nascent market, so users are constantly trying to educate themselves on the tools that are available," said Guy Yasika, a marketing representative at Klein Management Systems, Inc. in Chestnut Ridge, N.Y., and co-chairman of the New Jersey Oracle Users Group.

Many developers in the crowd demanded answers to the plethora of technical shortcomings they have been experiencing with their application tool kits. "Vendors still have to improve the ability of these systems to do large-scale application development. Most of the tools on the market are only suitable for creating small-scale systems," said Alice Rischert, former project manager at American Express Co.'s corporate human resources division in New York and now an independent consultant.

> "Vendors still have to improve the ability of these systems to do large-scale application development."
> Alice Rischert

Poor performance

According to Rischert and other attendees, even the industry's top-selling client/server development suites continue to come up short in some technical areas. "We've suffered performance problems with [Powersoft's] PowerBuilder between remote locations," said Carol A. Behan, an assistant vice president of investment banking and institutional sales at Merrill Lynch & Co. in New York.

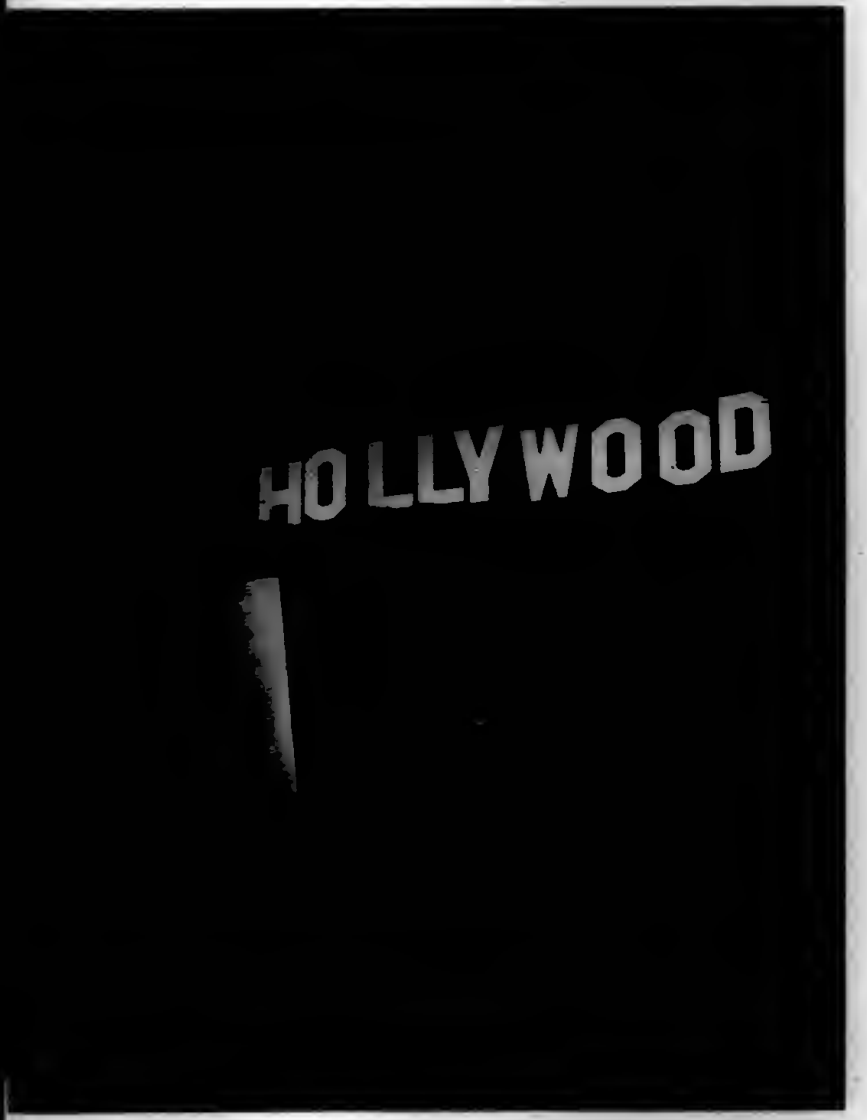
In fact, Behan, one of the many Oracle 7 users in attendance here, complained that none of the application tool sets she has tested — including PowerBuilder and Microsoft's Visual Basic — seem capable of fully exploiting Oracle's PL/SQL programming language. Of the six vendors that pitched their wares here, "Gupta is probably the furthest ahead" with PL/SQL functionality, Behan said.

One Oracle user who is an information systems manager at a large pharmaceutical company, said he had a problem with Oracle Forms' inability to access other competitive databases. "Plus, Oracle Forms 3.0, which most Oracle users are still using, is awfully stodgy," he said. "From a graphical standpoint, it's not pretty, and that's what these people want."

The key to success as a GUI programmer is clear, easy-to-read screens. See page 80.

12 locations. 130 special effects. 300,000 feet of film. A $50 million budget.

And one extraordinary company behind the scenes.



Sprint Technology Has Tinseltown Talking.

It takes a company with vision, energy and unsurpassed technology to spark a communications breakthrough in the world's most creative industry.

The company is Sprint, which has teamed with Silicon Graphics Computer Systems in an astonishing new production and broadcast network.

Sprint ATM and TCP/IP technology will link Silicon Graphics' Silicon Studio™ production environments from coast to coast. This new network has been called the first private data superhighway for transmitting digital film, video and interactive media instantaneously.

Which means a film editor in L.A. can collaborate with a sound designer in New York and a special effects producer in Boulder in real time. Without the costs, delays and risks of shipping actual footage.

The same Sprint breakthroughs that are revolutionizing Hollywood can do the same for your business. By giving you real communications solutions that get real results.

Now, if we can do that for Hollywood, imagine what we can do for your business.

Call 1-800-669-4700 to find out more.

Sprint. *Business*

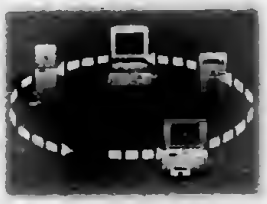
© 1994 Sprint Communications Company L.P.
Silicon Graphics, IRIS, and the Silicon Graphics logo are registered trademarks, and Silicon Studio and Showcase are trademarks of Silicon Graphics, Inc. The Hollywood sign, a trademark of the Hollywood Chamber of Commerce, is used with permission.

© 1994 The Estate of Marilyn Monroe. All Rights Reserved. ™ & MARILYN™, and NORMA JEANE are trademarks of the Estate of Marilyn Monroe. Represented by The Roger Richman Agency, Inc., Beverly Hills, CA.

No Matter How Attractive They Mean Nothing

The Individual Features, If You Can't Connect.

Connecting. It's really what the world is all about. The need to make contact, to work in concert, to be connected, is becoming more critical every day. At Zenith Data Systems, we not only recognize that fact, we're proud to be playing a major part in making it a reality.



From high-performance servers and network-ready desktops, to an award-winning line of notebook and subnotebook computers, ZDS products help people connect.

As the world continues to shrink, so do corporate computing resources: moving from "glass rooms" to office floors, to desktops, to laptops, to briefcases—and soon to pockets and purses. And a whole new breed of highly skilled and highly mobile workers is coming on-line to use them.

They work in workgroups that are both real and virtual. They need real-time, full-time, on-line access to all of their company's resources—whoever they are, wherever they are, and whenever they need them. And above all, they need computers that are as much communication devices as data- and word-processing devices.

At ZDS, we call this phenomenon Connected Computing. It's the core of an entirely new view of technology—one that addresses the numerous concerns of the individual, but also provides solutions for workgroups and enterprises. We're pioneering a new class of computing products designed to answer the needs of the business environment. Every ZDS product shares a common birthright: they're built to help people work together better. To get their jobs done faster. To get and stay connected.

And those better connections go beyond our products. We maintain strategic relationships and cooperative development agreements with major software vendors, peripheral manufacturers, and microprocessor designers. All to make sure that our computers don't just work better *than* all the rest, but also work better *with* all the rest.

Make the connection with us today, and find out how Connected Computing can give your company a competitive edge. We think that's a concept you can really get your arms around.

1-800-289-1320, Ext. 5103

ZENITH DATA SYSTEMS

MAKE THE CONNECTION™

Copyright © 1994 Zenith Data Systems Corporation. Zenith Data Systems Corporation is a Bull company. ZDS and "Make The Connection" are trademarks of Zenith Data Systems Corporation.

Federal law may sanction use of 'engineer' title

By Julia King

Brent Milton thinks he many have found a way to call himself a software engineer without breaking the law.

Milton, a software engineer at Odin Systems, Inc. in Memphis, recommends that other computer professionals who want to do the same should check out the U.S. Department of Labor's Directory of Occupational Titles. On page 43, the directory sanctions use of the title software engineer by anyone who, among other things, "researches, designs and develops computer software systems."

Milton saw the listing while researching job descriptions for new employees. He was advised to use the federal directory by Tennessee's Employment Security Commission, where he went to post the job listings in June.

Meanwhile, across the state in Knoxville, George Phelps at Data Research and Applications, Inc., just purged all company marketing literature, business cards and stationery of any reference to software engineers or software engineering. He did so to comply with Tennessee's title law, which similar to other title laws on the books in 45 states, prohibits computer professionals from calling themselves engineers [CW, May 30].

Tennessee's title law prevents anyone other than people educated and licensed in one of 36 engineering disciplines from using the words "engineer" or "engineering" to describe their occupation. Phelps' chief gripe is that software is not among the 36 sanctioned disciplines.

So Phelps, who now engineers software under the title "director of technology," has petitioned state representatives to change Tennessee's title act. He is also asking the state's Board of Architectural and Engineering Examiners to develop procedures whereby software engineers can be licensed the same as chemical or structural engineers.

What's in a name?

The five states that do not place restrictions on the engineer title are the following: Iowa, Nebraska, South Dakota, Washington and Wisconsin, according to a survey last year by the National Council of Examiners for Engineering and Surveying in Clemson, S.C.

"I have no problem with [the board] saying you have to be licensed," Phelps said. "I just hate people saying you can't use the title, and [then] there is also no way for you to get it."

Muddying the waters

Whether a federal government definition of a software engineer supersedes restrictions that states place on the title is unclear, said Paul Arne, an Atlanta attorney who specializes in computer law and an editor of the *Computer Law Association Bulletin*. "But the federal government's definition [of software engineers] is more consistent with reality," he said.

In the last few months, concern over the use of the engineer title has extended beyond Tennessee.

In Houston, Violet O'Brien, an information systems recruiter at The Whittaker Corp., said she now edits her clients' resumes, deleting references to software engineer or engineering.

"As I talk to people I'm recruiting, and just in conversation, I'm warning them that it's not really an OK thing," she said.

As long as the name-calling continues, Richard Rife, associate general counsel at Novell, Inc. in Orem, Utah, said the firm is advising its service technicians, called Certified NetWare Engineers, to use the acronym CNE rather than the word engineer. Field service people in several states have received "nasty letters" from state engineering boards, he said.

"You can be a sheep, or the shepherd."

The choice gets more critical.

The continuing explosion in information technologies is providing unprecedented opportunities for products, services and vendors.

The competition knows it.

Being informed gives the winning edge to the corporate executive who moves on to fresher fields, while the others contentedly graze the old.

For that reason, CW Custom Publications created The White Paper Program, The Computerworld Solutions Series, and multi-sponsored supplements offering inside information on emerging technologies. We work with giants like Motorola, Apple, OSF, Price Waterhouse, Oracle, IBM, UniForum, AIIM, SunSoft, OMG and many others.

Watch for CW Custom Publications–produced for the corporate leader who has learned that the first one to move ahead never has to fear being left behind.

Custom COMPUTERWORLD Publications.

FOR MORE INFORMATION, CONTACT CAROLYN NOVACK, PUBLISHING SERVICES DIRECTOR, CW CUSTOM PUBLICATIONS, BOSTON 1-800-343-6474

©1993 Computerworld Custom Publications

It's not whether you win or lose, it's how pathetically slow and overpriced you make the other guys look.

It's not their fault, they wanted to be faster and less expensive than UnixWare.

But in the latest independent TPC-B* Benchmark tests, UnixWare achieved unprecedented results in price-performance, easily beating MS Windows NT, Solaris and SCO UNIX. It set a new record, making it the most cost-effective and high performance 32-bit application server in the world.

UnixWare

MS Windows NT

SCO UNIX

Solaris

UnixWare stretches budget dollars by delivering greater performance at a significantly lower cost.

If it were just fast, that would be one thing. But UnixWare also clearly demonstrated new highs in reliability and recoverability from system failure.

All this should not surprise you, since UnixWare is built on the latest version of UNIX System V Release 4, and was developed by the same dedicated group of overzealous engineers who created the original UNIX operating system. And UnixWare is versatile, supporting over 2,500 business-critical applications.

To celebrate this thrilling victory, we're slashing up to 70% off the list price on a conversion to UnixWare from other UNIX systems. And while you're off upgrading from slow and overpriced to number one, we'll be quietly working on the next world record. And the competition will be trying to recoup.

It's so hard to catch up, once you've fallen behind. Which is yet another reason why you should be using UnixWare now.

yes UnixWare

NOVELL.

The Past, Present, and Future of Network Computing.

Call 1-800-879-6168 for a FREE copy of the TPC-B Benchmark Report.

*UnixWare test results from March 28, 1994 for a single Pentium™ processor Compaq® Proliant™ 2000 Model 5/66-4200A running OracleWare™ System-UnixWare Edition. Results $433 tpsB based on 184.54 tpsB. Other results detailed in TPC-B Benchmark Report.

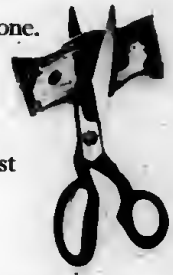
All company/product names are trademarks and/or registered trademarks of their respective companies.

From The Company
That Taught The World
How To Combine Power
And Affordability:

Lesson Two.

intel inside

When we introduced the Compaq ProLinea, it was more than just a new computer. It was a whole new idea. The first computer to deliver the right features and high quality at a price that was affordable for everyone.



And now we'd like to build on that idea. Introducing our newest ProLinea: A computer that's been designed to make your money go further still.

To begin with, it's fast. Our new ProLinea offers a choice of Intel processors, right up to the IntelDX4. Video is up to 27% faster. With support for a 128K memory cache, you can boost speed another 35%. And, should you ever thirst for greater speed, you can easily upgrade to a Pentium OverDrive.

But going faster is only part of our story. True to the Compaq spirit, we made ProLinea even easier to use. It comes pre-loaded with the latest version of Microsoft Windows, along with TabWorks,™ which graphically simplifies the way you view and organize all of your work.

It also comes with built-in Plug and Play capabilities, bringing new ease to the process of adding add-on devices and expansion cards.

And while we made the ProLinea easier to work with, we also made it easier to own. It meets Energy Star standards, to save money in the long run. Better still, it's priced to keep your costs down today—starting at only $950.* That, of course, includes all the benefits of owning a Compaq, from our free three-year warranty** to our free 24-hour helpline.

If you'd like a demonstration of affordable, easy-to-use power, go try a ProLinea at your nearest authorized Compaq reseller. If, on the other hand, you'd like to receive specifications via fax, just call 1-800-345-1518, choose the PaqFax option and request document #4032.

It's a moment in computer history everyone can savor — as Compaq raises the value of a dollar once again. **COMPAQ**

© 1994 Compaq Computer Corporation. All Rights Reserved. Compaq and ProLinea Registered U.S. Patent and Trademark Office. PaqFax is a service mark of Compaq Computer Corporation. TabWorks is a trademark of Xerox Corporation. Windows™ is a trademark of Microsoft Corporation. Pentium and the Intel Inside logo are registered trademarks of Intel Corporation. *Estimated selling price, actual pricing may vary. Price quoted refers to the ProLinea 4/33s Model P (no hard drive included). **Certain restrictions and exclusions may apply. Monitors, battery packs and certain options are covered by a one-year warranty.

Multimedia, imaging next on Sun's agenda

By Cara A. Cunningham

After reporting record fiscal earnings of $195.8 million recently, Sun Microsystems, Inc. is not about to rest on the success of its workstations. New strategic arenas for Sun include imaging and multimedia for both the corporate and home markets, said Scott McNealy, president and chief executive officer.

In an interview last week, McNealy attributed the company's record financials to a raft of new products that Sun introduced this spring. Those included the SPARCstation 5, faster SuperSPARC chips, Solaris 2.3 and the SPARC Storage Array.

Sun's results included $1.4 billion in revenoe for the quarter ended June 30, an 11% increase over the previous year. Profits rolled in at $78 million, a 2.3% increase over the year-earlier period. "I would say it was a very, very good year," McNealy said. The services sector is "growing very nicely," he added, altbough he declined to give specifics.

CEO Scott McNealy *says multimedia is a key new market for Sun*

Bite of the apple

Imaging is a growth area for Sun, he said, aod the performance of the voodor's new 24-bit, low-end desktop machine "is going to take on Apple in the publishing market very aggressively."

Also new is the company's push into multimedia. Last month, Sun and Thomson Coosumer Electrooics SA joined forces to provide multimedia servers and Asynchronous Transfer Mode products for the homo market. However, corporate customers will get first crack at those wares, McNealy said.

"This stuff is hard. It's going to take a while, and it will show up in corporations before it shows up io homes," he said. Likely candidates include real-time, two-way interactive video and multimedia workstations that sport a camera, keyboard, speaker, mouse, microphone and television-quality displays, McNealy added.

> Sun has already pledged its support to the OpenDoc object technology from IBM, Novell and Apple. "But we will not be religious," McNealy says.

Workings of the group

Another key area will be electronic mail and groupware. "Giveo that our slogan is 'The oetwork is the compoter,' obviously network-centric applications such as Mosaic, E-mail, Notes and others are going io target the SPARC/Solaris environmeot," the 39-year-old CEO said.

Further, he said, Suo will play oo both sides of the object war. The company has already pledged its support to the OpenDoc object techoology from IBM, Novell, Inc. and Applo Computer, Inc. "But we will oot be religioos," he stressed. Sun will ensure its objects also "can speak" Object Linking and Embedding, Microsoft Corp.'s rival object specification.

Cunningham is a Paris correspondent at the IDG News Service

Sun's new hardware chief sets priorities

J. Phillip Samper was named president of Sun Microsystems Computer Corp. and corporate executive officer of Sun Microsystems, Inc. in February. A former Eastman Kodak Co. executive and former chief executive officer of Kinder-Care Learning Centers, Inc., Samper had been a member of Sun's board of directors for three years.

In the first few months of his job, Samper has been evaluating Sun Microsystems Computer's resources and business focus and defining how Sun's divisions can present one "face" to customers. He met recently with Computerworld *Editor Paul Gillin and Jean S. Bozman, senior editor of open systems.*

Q: You got off to a very quick start here.

A: There wasn't very much choice. The tidal wave was coming. You either swim or jump on your board and try to surf. [It's] the way the industry is moving, the way the company has to move. The way I spend my 16 hours a day, seven days a week of activity [is that] when I'm traveling in a plane, I'm on the phone. If I'm in the car, I'm on the phone. That's just the way it is.

Q: What are your top priorities?

A: One of the priorities is to get myself familiar with Sun. As a member of the board, I had some knowledge of Sun, but there's a big difference between being a member of the board of directors and being a full-time employee.

Secondly, I wanted to identify where I felt we had to put the emphasis from a tactical as well as a strategic point of view. [I wanted] to get my new team together and have us work to identify what those items are. One of them is to try and develop an inventory of our technology assets, to make certain that we are focusing on the opportunities.

Q: How can Sun present one face to the customer?

A: That has been my aim — to try to simplify the customer view. And we have had a number of conversations at the management level on it. What we have agreed to is from a customer point of view: If it's a Sun Microsystems Computer customer, Sun Microsystems Computer takes the lead. It's our customer, and the others provide the support.

Q: Since this is such a speed-and-feed oriented market, how important is it to you to have the fastest processor — relative to having the best software support and customer service?

A: Of course, I think it depends on the marketplace. Looking at the technical marketplace with solution-critical speed needs, it's very important. But I think the software and service element of the package is extremely important. And that would include, of course, integration. It would include a knowledgeable sales force. It would include the ability of every element of Sun to communicate with the users and understand their needs.

Q: The issue of providing good customer service and support to users continues to linger, particularly with respect to third-party providers. Is it possible that could change?

A: We're investing more money in this fiscal year [on] training, [putting] more people on the street — our people who assist the third-party suppliers. We're hiring more people in sales and certain areas of marketing.

Q: Will you continue to have third-party service providers?

A: Absolutely. I think the issue is how do we more effectively support and work with the third parties. There are a couple of elements to that. One is just straight service. The other one is integration. Therefore, we're getting much closer to organizations like Andersen Consulting and so on. The customer needs more support, and we have to be smart enough to recognize their needs and then work with the third-party suppliers so we can come forward to the customer as a team.

Q: What about Sun's emphasis on the commercial marketplace?

A: Sun has been in the commercial marketplace a lot longer than people have given it credit for. It's dominated the trading floor game around the world. But I must stress we are not pulling away from the technical marketplace. And I have said we're probably going to have to put more emphasis on the technical marketplace this fiscal year than we did last year.

Q: Sun's reputation has always been that of the innovator. Do you think it's possible to be seen as being as innovative as you were in the past, given that there is so much competition right now?

A: I think so. I think, too, that there has been a great deal of talk about Sun's position in the market, and yet I look at the numbers . . . and I see Sun continuing to play the lead role in all of those marketplaces. I guess I don't see the situation [as being] as negative as some members of the press. I look at the same data they do, and I go out and talk to customers. What I hear is everybody wants us to do better. As do I, by the way.

Q: What about Sun's image in the marketplace, particularly with respect to PCs?

J. Phillip Samper, *president of Sun's hardware subsidiary, says he is staffing up sales and marketing in the financial, manufacturing and government segments*

A: I think Sun's image in the marketplace as a workstation and server [company] is an image that can be built upon and will provide good business well into the future. . . . The interface of our servers with PCs in a heterogeneous environment is something we live with today, and we want to. That's another opportunity for us.

Q: Is selling large Unix servers one of the main ways you're going to boost profitability?

A: Well, servers are a critical profit generator and will continue to be. Servers are growing, and they are growing at a good rate. Margin is always going to be a problem for this industry, so we have to find ways to be more efficient. I'm going after cost.

Q: You have nearly 13,000 employees. Would you consider a layoff?

A: We have no policy against it.

Q: Are you hiring? Are you going to increase staff this year?

A: We're hiring in some areas and declining in others.

Shortly after the interview, Sun confirmed it had eliminated about 130 positions at Sun Microsystems Computer, including 30 in marketing. However, new jobs were posted for other marketing positions at the hardware division, a Sun spokesman said. The move, which was not termed a layoff because overall head count was not reduced, came several weeks after a reorganization at SunSoft, Inc., Sun's software subsidiary.

When the designer in L.A. showed his collection via computer to the buyer in D.C., he reworked each piece until he saw her smile.

Now you can, too.

Introducing AT&T WorldWorx™ Solutions: video, voice and instantaneous data sharing.

It's simple to use. It's affordable. And it enables you to collaborate on everything from spreadsheets to word processing to design. Because you'll not only see and hear each other, you'll be able to work on the same document at the same time, just as if you were sitting next to each other instead of across the country. So you'll be able to save time and make decisions faster. Which could be the business advantage you've been waiting for.

AT&T BUSINESS ADVANTAGE

So whatever your business, find out how AT&T WorldWorx Solutions can help you transform the way you work with other people.

Just call us at 1 800 828 WORX.

AT&T WorldWorx™ Solutions.
Changing the way people work...together.

© 1994 AT&T
WorldWorx is a trademark of AT&T

AT&T

RACE ACROSS THE NETWORK. COLLECT ENORMOUS FINANCIAL

The CEO calls. He wants to talk about your overall enterprise computing strategy.

Your CFO wants to review your entire software budget. Today.

There's a request for another site license of your graphic arts program. Hard to say if Creative Services needs that or not.

There's a hot, new presentation package out, but it demands 486s with 4MB of RAM or more. Does the Marketing Department have any machines like that?

You could spend days running around trying to resolve issues like these. Or you can install Norton Administrator for Networks™ (NAN). NAN is designed to help you manage in today's complex, heterogeneous, enterprise-wide computing environment more effectively. Whether you're running Novell NetWare, IBM LAN Server, Microsoft LAN Manager, or Banyan Vines architectures.

This is no game. How you manage your enterprise resources will determine whether your company wins or loses. Tools from Peter Norton can be the deciding factor.

NAN provides you with a set of integrated tools that conduct a complete and accurate hardware and software inventory automatically over the network. So you have a thorough and detailed record of every configuration of every workstation across your corporate enterprise. Tools that install and update software automatically over the network from one central console. And tools for software metering so you can prevent license violations without buying more capacity than you need, and be able to protect your network from pirated software applications.

All of these integrated tools are on one centralized network management console.

The NAN console integrates other Norton Network Series products as well. Such as Norton AntiVirus® for NetWare™ (NAV-NLM), Norton AntiVirus® (NAV) 3.0, and pcANYWHERE.™

Norton Administrator for Networks lets you reach out across your network to monitor every asset and activity on your LAN. You can upgrade users. Stay current on site licenses. Assist remote logins. All without ever leaving your desk.

YOU'RE IN COMPLETE COMMAND WITH NORTON ADMINISTRATOR FOR NETWORKS.

NAN inventories all of your hardware and software PC assets automatically via an executable in the user's log-on script and records them in a database located on the server of your choice.

You can filter the database to find the number of 486 PCs, the number of your users sharing a site license, the number of machines with 4MB or less, or whatever else you need to know.

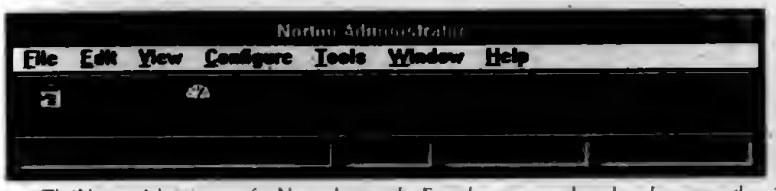
Out of the box, NAN tracks over 22 categories and over 180 items of information. You can edit and expand the database to include unrecognized applications like the

*Gartner Group 1993 Symantec Norton Administrator for Networks.

products you develop in-house. Extensive charting options make for easy analysis and presentation of your inventory reports.

SAVE MONEY EVERY TIME YOU INSTALL SOFTWARE.

Upgrading software typically costs about $500 per PC. NAN substantially reduces that cost by letting you quickly install, update and configure all of your software from its console. Whether it's an app or a boot file. NAN even tracks who was upgraded and who wasn't.



The Norton Administrator for Networks console. From here you can launch and manage other Norton Network Series products like Norton AntiVirus for NetWare, Norton AntiVirus 3.0 and pcANYWHERE. And that's just the start of our growing and evolving enterprise management solution.

PAY LESS IN LICENSE FEES. PAY NOTHING IN FINES.

There are stiff penalties for software piracy. Up to $100,000 for every illegal application found.

In 95% of these cases, all the penalties are levied against the corporations and not their users. NAN helps ensure that your company doesn't end up paying for someone else's crime.

In fact, should your company ever be audited, your NAN log can be submitted to the Software Publishing Association for use as evidence of your corporation's site license compliance.

Beyond its own powerful feature-set, our Norton Administrator for Networks is a member of our new Norton Network Series.

RESCUE USERS IN DISTRESS. REWARDS. MASTER TIME ITSELF.

Scripting tools let you create programs and dialog boxes for software distribution ensuring user compliance with your upgrades.

From its central console, NAN meters application usage on your workstations and servers so you can plan, budget and pay for only the site license capacities you really need.

In 1993, the experts at The PC Asset Management Institute estimated that corporations paid out $1.7 billion for software they already owned. Clearly, NAN can positively impact your company's bottom line.

Only 15% of your costs are PCs and hardware. The other 85% is tied up in technical support, administration, and other end-user operations—exactly where NAN saves big dollars.

NAN can also help protect your network from being infiltrated by pirated applications brought into your enterprise by users.

THE NORTON NETWORK SERIES.

Today, all Norton Network Series products share a central console with a single user interface.

Tomorrow, they'll share data between their applications.

So an antivirus intervention can automatically trigger a backup file restoration. Metering on one LAN can trigger metering on another LAN. Or a new software upgrade can automatically generate a freshly updated inventory report.

It adds up to a more time and cost effective way to manage all of your end-user resources.

So you can focus on building the reliable, responsive, information-rich network you need to make your company more competitive.

Call for our White Paper today. And master your enterprise.

CALL 1-800-453-1135.

Ask for Extension 9B33 and request our White Paper: A Network and Enterprise Strategy to Reduce PC and LAN Operating Costs.

White Paper available in U.S. only
For more information in Canada, call 1-800-667-8661

SYMANTEC.®
MANAGING THE ENTERPRISE.

Norton AntiVirus, Norton AntiVirus for NetWare and pcANYWHERE are trademarks or registered trademarks of Symantec Corp. All other trademarks or brand names are the property of their respective holders. ©1994 Symantec Corp. All rights reserved.

Computer Industry

Briefs

Cray losses mount

Cray Computer Corp. reported a loss of $11.2 million last week for the second quarter, which ended June 30. The loss nearly equals the $11.8 million loss reported for the same period last year. Officials said restrictions from the spin-off agreement with Cray Research, Inc. expired last week, allowing it to pursue new strategic relationships.

Wang rebounds

Wang Laboratories, Inc. posted a profitable fourth quarter and its first profitable year since 1988 for its past fiscal year, which ended June 30. Quarterly revenue was $207.6 million, compared with a $10.4 million loss a year ago. Wang has also laid off 430 employees this year.

Parallan's peril

Parallan Computer, Inc. posted a $3.6 million loss for its second quarter, which ended June 30. The server and network software supplier expects to post losses for the next several quarters due to the loss of funding from the IBM PC Co.

SHORT TAKES Switching system developer **Chipcom Corp.** in Southboro, Mass., and **National Semiconductor Corp.** in Santa Clara, Calif., are developing 100M bit/sec. technology for "fast" Ethernet hubs that will support database, design and multimedia applications.... **Multimedia product supplier Media Vision** has filed for Chapter 11 bankruptcy protection to complete a restructuring of the company ....**Stratus Computer, Inc.** in Marlboro, Mass., last week reported a $17.4 million profit for its second quarter, which ended July 3. ...**Franz, Inc.** in Berkeley, Calif., plans to acquire the technology assets of development systems supplier **Lucid, Inc.** in Menlo Park, Calif. Franz will distribute Lucid's software development tools product line.

Growing pains hit client/server arena

Vendors struggle in overcrowded market, upgrade products to fight back

By Rosemary Cafasso and Melinda-Carol Ballou

Market transitions are killers, and nowhere is that more evident right now than in the client/server tools arena.

With the notable exception of Powersoft Corp., some of the biggest names in the client/server tools business are showing clear signs of growing pains as they fine-tune their products. Many of the tools vendors are bringing out more scalable and fully featured versions of their wares in the midst of cutthroat competition for the corporate audience.

This is apparently taking its toll. KnowledgeWare, inc., for example, is cutting 25% of its 900-plus work force, a step it announced in late July. The company said the move was brought on by poor financial results in its fourth quarter, which ended June 30. Final results for the quarter are expected this month.

Last week, Gupta Corp. announced an $11.5 million net loss for its second quarter; revenue came in at $10.3 million. In comparison, it reported $13.5 million in revenue and a profit of $892,000 in the same quarter last year.

"There are a tremendous amount of strong players and some very significant companies are going to do very badly even as the market grows because of overcrowding," said Curt Monash, president of Monash Information Services in New York. "The market must consolidate."

Sale setbacks

Even the bigger players have taken some missteps. For example, Richard Hanlon, an outside consultant handling investor relations at Gupta, said the company's second-quarter results can be explained in part by sales that came in "dramatically lower than the company had expected and expenses [that] were dramatically higher."

One key factor in the sales results can be traced back to Gupta's previewing of SQLWindows Release 5.0 several weeks before it was ready to ship, thus bringing future sales of its existing product to a halt, Hanlon said.

KnowledgeWare first experienced financial trouble more than a year ago, and analysts said the vendor must more effectively target its customers if it hopes to regain and retain profitability.

"We had a company that had a very healthy user base" with its Application Development Workbench, said Ed Acly, an analyst at International Data Corp. in Framingham, Mass. "That base has continuously been declining, and while they have made some progress with sales for other products, it hasn't been enough to fill the gap."

Even Powersoft, which last week reported a whopping $32.6 million in sales for the second quarter — up from $11.6 million in the same quarter last year — expressed caution for the upcoming quarter.

"Everyone knows [PowerBuilder 4.0] is coming and, as always, when there's a new release, there's always the danger that people will defer their buying," said Mitchell Kertzman, Powersoft chairman.

Seagate adds Palindrome to portfolio

By Mary Brandel

A patchwork quilt might first come to mind when you look at Seagate Technologies, Inc.'s acquisitions since the spring.

Since May, the $3.5 billion disk drive and storage components maker has bought a report writer firm and 25% of a speech recognition company (see chart).

Just last week, the target was Palindrome Corp. in Naperville, Ill., which makes storage management software for LANs. And Seagate promised there will be more acquisitions to come.

"At first blush, there's not necessarily a lot of synergy associated with the companies," said Crawford Delprete, an analyst at International Data Corp. in Framingham, Mass. "But if you drill down, especially considering [Palindrome], things start coming into focus."

Futuristic plans

The bottom line is Seagate wants to build a $1 billion software business by 1999.

The reason: "Disk drive makers operate under extremely thin margins," said Tom Koffman, an analyst at Dean Witter Reynolds in New York. "Software generally has fat margins, so [the acquisitions] could complement the business model."

Even though storage demand is insatiable, revenue growth at Seagate is 10% to 15% due to price declines, said Steven Luczo, senior vice president of corporate development. "That's good growth on $3.5 billion," he said, "but it's not [the chief executive officer's] mode of, 'I want to build new businesses.'"

Tight focus

And rather than being far-flung, Luczo said, the acquisitions are focused in two areas: intelligent interfaces and intelligent data storage.

"We're a data management company focused on manipulating, moving and analyzing data" to increase network efficiency, he said.

With the addition of Palindrome, Luczo said, Seagate hopes to make storage more intelligent, where "data is stored in data sets that are related to one another and with pointers so you know where the content is stored."

"You're seeing a strategy slowly unfold," said Michael Peterson, an analyst at Peripheral Strategies, Inc. in Santa Barbara, Calif., comparing Seagate's plan with those of "successful system network or storage management conglomerates" such as Legent Corp., Sterling Software, Inc. and OpenVision Technologies. "The business model is one of acquiring core technologies that complement each other to build an overall integrated architecture and strategy. There's no reason why Seagate can't take this business model and run with it."

Spending spree

Seagate plans to build a $1 billion software company through acquisitions made this year

Company		
Crystal Computer Services, Inc. Vancouver, B.C.	Windows-based report writers	$18.6 million*
Dragon Systems, Inc. Newton, Mass.	Speech recognition technology	25% ownership
Palindrome Corp. Naperville, Ill.	LAN tape backup software	$69 million

*Stock transaction

Source: Seagate Technology, Inc., Scotts Valley, Calif.

The purchases may appear at first to be risky endeavors that the cash-flush company does not seem to need. But analysts said the company is taking the right approach — namely, a cautious one.

So far, the acquired companies are small, under $70 million, and they will continue operating as before with management reporting to Seagate. "We're not trying to pretend we have management expertise in software," Luczo said.

Still, said Todd Baker, an analyst at Hambrecht & Quist, inc. in San Francisco, "We're taking something of a wait-and-see approach to see how they'll integrate all these acquisitions."

To

Speed

the Development of Complex Applications,
You've Always Needed the **Right Tools**
for the **Right Jobs.**

Now *You've Got the Right Tool for Finding Them.*

Turn to the New

Application Developer's Toolbox

on Page 95.

COMPUTERWORLD
Marketplace
The Product Classified Source for IS Buyers

"LAWSON achieved the *highest* overall SATISFACTION ratings *from* its *users.*"

COMPUTERWORLD

Of our 1900 clients worldwide, an impressive number are now up and running with Lawson client/server open enterprise solutions. On SYBASE,® ORACLE® and INFORMIX.®

According to *Computerworld's* Guide to Client/Server Financial Software, an even more impressive number give us top marks for overall quality and results. Lawson was rated *highest in overall satisfaction* of all the companies surveyed.

Call 1-800-477-1357 extension 844, and find out why.

LAWSON
Software

Obituary

"It is with mixed emotions that we announce that the 'death-of-the-mainframe' reports croaked last week following a spirited and protracted fight with reality.

"The final nail in the coffin of the PC weenies who authored the reports was pounded in by IBM, which announced quarterly results that smartly exceeded expectations due to healthy mainframe sales. In addition, IBM announced it will sell every hunk of big iron it can churn out for the foreseeable future.

"Services and celebrations will be held at intelligently managed corporate IS sites."

Yes, it is true. While it certainly is not destined to be a long-term trend, corporations are greeting the general economic recovery by buying mainframes again. The installed base of mainframe MIPS is actually increasing.

How can that be? Haven't corporate sites heard about client/server and distributed computing?

The answer is yes, they have, and that is actually one factor fueling this minisurge in mainframe computing. As has been suspected in some quarters, the client/server environment is still not up to the task of handling most mission-critical applications due to some "minor" deficiencies such as system security, data management, backup and so forth.

So while this promising environment develops, IS managers are going on with the business of information management with the best tools they have, which in some cases are still bought at the mainframe store.

Other factors are pushing this temporary mainframe revival. Users are finding some interesting applications of mainframe technology right in the midst of the distributed PC and LAN-based environment.

For example, as we reported last week in our Large Systems section, some users are discovering that mainframes are coming in very handy for backing up data generated by Unix LANs and PC LANs. It seems the discipline and characteristics of the mainframe environment — things such as automation, security and reliability — come in very handy in the relatively undisciplined client/server world.

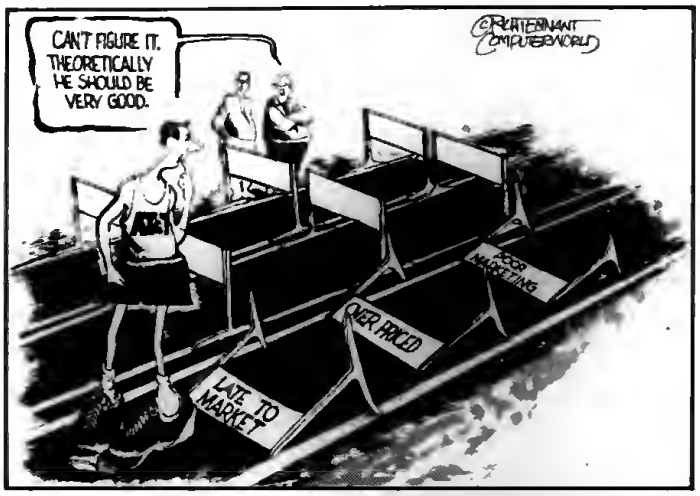
In other words, the mainframe is actually being used as a card-carrying member of the the client/server revolution, which will in fact replace most mainframes in the future.

This whole topic wouldn't be worth writing about if not for all the damage done by the general overselling of distributed computing, which induced some senior executives to demand a halt to the expansion of mainframe MIPS. Perhaps now such people will understand that revolutions in information technology really don't occur. There are no magic bullets to information conundrums; they simply take time to resolve.

But at least, having penned this obit, I won't have to write about this subject here again.

Bill Laberis

Bill Laberis, *Editor in Chief*
internet: *blaberis@cw.com*



Rich Tennant is on sabbatical. This is one of his classic cartoons from 1988.

Who's to blame?

Congratulations to Phillip Zakas and his team on a truly wonderful job of solving the problems in his network ["Virus!", CW, July 11].

But here's the *real* bun-froster: Who *caused* it? Who infected your system? And who will pay for the costs incurred by your organization in terms of lost productivity and loss of valuable files?

Go after the perpetrators, make public spectacles of them and make them pay back the organization for its losses. Viruses are not a game.

Alan Falk
Cupertino, Calif.

Not your E-mail

I can't believe some of the comments on electronic-mail privacy that have wasted publication space, let alone the talk of passing legislation to support something so ridiculous.

Tell these people to get a life! E-mail is a business tool to aid employee communication on business-related matters. If people have nonwork-related things to discuss, they should do it elsewhere.

These same people probably think they have the right to store private letters on company storage systems (which they no doubt created using the company's hardware and software) and that the system administrator has no right to see what these files are while trying to control space wasted by unneeded files.

Steve Biese
Onley, Md.

That's *Daniel*

Alan Radding's excellent overview of Internet front-end software ["No easy ride," CW, June 20] incorrectly identifies Bruce Dern as author of *The Internet Guide for New Users*. Perhaps Radding was watching the television screen instead of his monitor — Bruce Dern is an actor.

Daniel Dern — that's me — is the noted (in my humble opinion) Internet author, analyst, pundit and answer guy. I hope people are beginning to ask Bruce Dern if he's related to me.

Daniel Dern
Newton, Mass.

Consultant picture used broad brush

Just when you think "consultant bashing" is no longer in vogue, *Computerworld* publishes "Ability to baffle consulting" [CW, June 20]. Tim Lynch's parochial views swipe at two sectors of the IS community — the consulting industry and senior IS managers — and are not appreciated (nr shared) by either.

First, Lynch ridicules the whole consulting industry as inexperienced, unqualified, greedy people interested only in undermining their clients' IS organizations to sustain their own profit motives through confusion and disarray. Why don't we read about dozens of consultancies going out of business every week due to this proliferation of unethical behavior?

IS professionals dedicated to becoming true consultants fill many IS needs. Consultants know that they are only as good as their last engagement. That pushes them to strive for excellence and constantly demonstrate their proficiency — knowing their reputations are at stake.

Second, Lynch takes a swipe at IS management as nothing more than in-house retirees too illiterate to understand consultants. It has not been uncommon for our staff to undergo drug testing, criminal background checks and credit checks when interviewing with a potential client. I'm just not aware of any "sight unseen" contracts.

There are just as many qualified consultants on the public market as "private" employees working for the Fortune 1,000. Though the same code of ethics is not followed by everyone, it is unfair to libel the entire industry in this manner.

David J. Feher
Dallas

BEST COMPUTER NEWSPAPER 1992, 1993
COMPUTER PRESS ASSOCIATION

■ Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail: 279-6273; Internet: letters@cw.com. Please include a phone number for verification.

COMPUTERWORLD

Editor in Chief
Bill Laberis
Editor
Paul Gillin

News Editor
Maryfran Johnson
Sections Editor
James Connolly
Assistant News Editor
Patricia Keefe
Assistant Sections Editor
Johanna Ambrosio
Technical Editor
Charles Babcock
Senior Editors
Elisabeth Horwitt
Networking
Craig Stedman
Large Systems
Ed Scannell, PC Software
Michael Fitzgerald
Mobile Computing
Rosemary Cafasso
Client/Server Software
William Brandel, PC Software
Steve Moore, Networking
Senior Writers
Melinda Carol Ballou
Lynda Radosevich
Mary Brandel
Staff Writers
Stephen P. Kliett Jr., Jaikumar Vijayan
New Products Writer
Tim Ouellette
Research Coordinator
Stefanie McCann

Features Department
Senior Editors
Joseph Maglitta, Corporate Strategies
Lory Zoffoli Dix, In Depth
Jennifer deJong, In Depth
Allan E. Alter, Management
Michael L. Sullivan-Trainor, CW Guide
Associate Editors
Jodie Naze, Careers and Marketplace
David B. Weldon, Management
Cathleen Duffy, CW Guide
Senior Researcher
Kevin Burden, Firing Line/Scorecard
Assistant Researcher
Erin Callaway, Resource Center
Pluralism Intern
Renee Barber

Chief Copy Editor
Anne McCrory
Assistant Chief Copy Editor
Christina Alcardi Maguire
Senior Copy Editors
Kimberlee A. Smith, Jill Zolot
Ellen Fanning
Copy Editors
Michelle I. Keyo, Jay F. Rizoli
Kimberly Gilliard, Michelle Grabon

Design Director
Nancy Kowal
Senior Graphic Designer
Tom Monahan
Design Assistant
Janell Genovese
Graphic Designers
Stephanie Faucher, Mary Beth Welch
Graphics Specialist
Jose E. Bruzual
Cartoonist
Rich Tennant

Office Manager
Linda Gorgone
Editorial Assistants
Lorraine Witzell, Connie Brown
Aleksandra Skutte
Rights and Permissions Manager
Sharon Bryant

Electronic Marketplace Liaison
Lisa Davidson

Computerworld Client/Server Journal
Alan Alper, Editor

Managing Editor of Special Projects
Catherine McCorey

News Bureaus
Mid-Atlantic
Thomas Hoffman, Senior Correspondent
(201) 967-1360
Julia King, Senior Editor
(215) 532-7599
Washington, D.C.
Mitch Betts, National Correspondent
(202) 347-6718
Gary H. Anthes, Senior Correspondent
(202) 347-0134
West Coast
(415) 347-0555
Jean S. Bozman
Senior Editor, Open Systems
Mark Halper, Rim S. Nash
Senior Correspondents
Sunichi Mohan, Correspondent
Chris Flanagan, Editorial Assistant
Midwest
Ellis Booker, Senior Editor
(708) 827-4433
Pacific Northwest
Stuart I. Johnston, Senior Correspondent
(206) 641-7770

Main Editorial Office
Box 9171, 375 Cochituate Road
Framingham, Mass. 01701-9171
(508) 879-0700
TDD: (800) 428-8344
MCI Mail: 279-6273
CompuServe: 76537,2413
Subscriptions: (800) 669-1002

The Hierarchy of (Computing) Needs

Jerrold M. Grochow

Many of us remember Maslow's Hierarchy of Needs from Psych 101: You need food before you worry about shelter; you need shelter before you worry about work; you need work before you worry about "self-actualizing." (Yes, I know there was something about sex in there, but this is a family magazine.) The Hierarchy of Needs has been found to be an effective device for analyzing (and predicting) behavior in a wide variety of situations.

Some of us road warriors of the personal computing age seem to be living by a new hierarchy of needs. First we need computing power, then we can worry about connectivity; with connectivity, we start to think about database access; once we have access, we try to create information; and as we create information, we protect it with security.

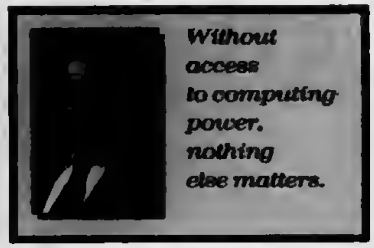
Without access to computing power, nothing else matters. In today's PC world, this means an Intel 1486-based processor with a minimum of 8M bytes of memory.

Access to all, for all

Once we have computing power, we need to be connected to electronic mail, news feeds, bulletin boards, mainframes and application servers.

Most of the complaints our network services group deals with have to do with lack of connectivity: "The gateway to the mainframe is down," "The mail server isn't responding" or "I don't get an answer when I dial in." Clearly, this is a tough part of the hierarchy to be at.

With connectivity established, we quickly focus on data. We use connected computers to access a wide variety of data — corporate databases, research services, project archives and so on. After all, that's why we needed the computers in the first place, isn't it?



We need more than database access; we need information access. In order to effectively use the data, we need the tools to organize and access that data: inquiry, statistical, analytical and predictive programs — even expert systems and neural networks.

Finally, once we have the computing power connected to the databases we can effectively access, we begin to worry about security. Is the information we use and generate properly secured? Can the right people gain the right kind of access? As we create the new corporate "information assets," can we protect them the same way that we protect other corporate assets?

The interesting thing about this hierarchy of needs is that our behavior quite naturally implies its existence. People without adequate computing power don't really worry about connectivity. People with connectivity problems don't worry much about databases. People who have finally gained information access then start worrying about security. You have to arrive at each level before you worry about problems at the higher ones.

So the next time you hear your staff members complaining, remember where they are on the Hierarchy of (Computing) Needs.

Nobody really wants to be on the first few levels. They would rather focus on how to use the computer to create and process information pertinent to their businesses. And it's up to you to help them get there.

Grochow is chief technology officer at American Management Systems, Inc. He can be reached at jerry_grochow@amsinc.com.

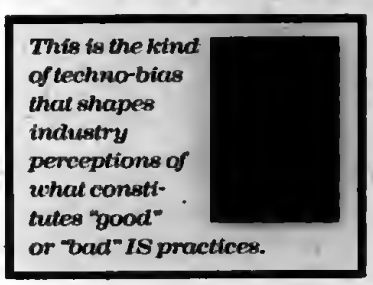
Are your IS solutions fashionable?

Max D. Hopper

Stop, hold everything! This just in: Client/server is out. If you haven't yet scrapped your frumpy old mainframes and slathered your corporate information technology landscape with client/server systems, don't. Or if you have done so but still haven't quite sorted out the integration problems to achieve the kind of reliability and management control you used to take for granted, don't bother. Even if you're past those hurdles (be honest now) but just can't seem to make client/server "solutions" fit those core business problems the old mainframes handled so deftly, stop trying.

If you were one of those plodders who doubted client/server computing was a universal panacea or were never even really clear on what the term meant, don't worry. Client/server is passe. The latest buzz in the halls of haute tech is that massively parallel processors are in. They're the next hot item in hardware and the cool new computing strategy that will be the salvation of information systems.

Pardon the irony. If my tongue appears to be stuck in my cheek, it's because of a story a CIO colleague recently told me. He was being interviewed by a representative of a major vendor in the PC market. The vendor wanted to do a story on his company's IS department. Or should I say the vendor did until it became apparent that centralized processing still plays a vital role in the CIO's enterprise. This was not a "PC" strategy, in its view, hence no story.



It didn't matter that his company was among the top corporate users of this vendor's products. The critical issue was that it had not eliminated the "stain" of centralized processing.

This is the kind of techno-bias that shapes industry perceptions of what constitutes "good" or "bad" IS practices and obscures what current practices really are. It elevates certain information technology tools and techniques to omnipotence and exiles others to obsolescence.

I have no ax to grind with information technology innovation in general or client/server approaches in particular. American Airlines' Sabre Group is among the earliest to evaluate and adopt those new tools that promise genuine solutions. Indeed, we have more broadly implemented and more thoroughly integrated client/server systems enterprisewide than most companies.

But let's keep *all* new information technology tools in perspective. Each has its strengths and valid applications for certain business processes. Let's not allow ourselves to be convinced that any one technology, no matter how popular or how potent, will be our deliverance.

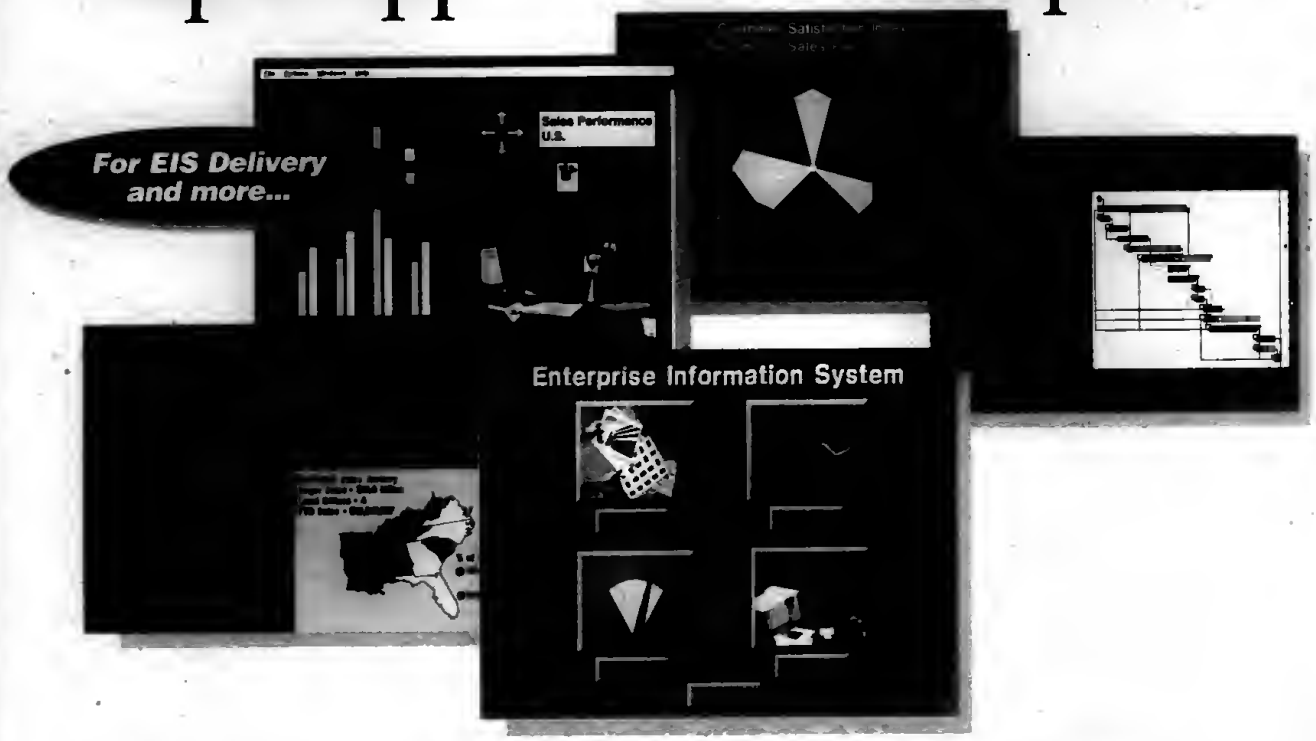
The march of technology is not a fashion show. Yet given the bandwagon rush of vendors to promote the latest information technology trend and the euphoric media hype that dismisses its limitations, it's easy to conclude that "one size fits all" and "everyone's" wearing it, or should be.

One can easily get the notion, for example, that implementing client/server systems on an enterprisewide basis is less costly and less complex than traditional legacy system approaches and that client/server enables shorter application development times. While true in some cases, general experience would contradict this for major projects.

So get real. Recognize that the best solution for our enterprise computing needs is a broad mix of tools and strategies, each doing what it does best, working together in an integrated environment of cooperative processing.

Hopper is chairman of AMR Corp.'s The Sabre Group

Client/Server Rapid Applications Development



The tough decisions aren't always made at the top. That's why it's important to empower executives and every *other* decision maker with the right information...at the right time. And that's also why the SAS® System is redefining the role of applications development, giving you a complete *enterprise information system* that taps directly into your organization's vast information reservoir.

Bring an Enterprise View to Every Desktop—Executive and Otherwise

With the SAS System, you can build custom-tailored applications in far less time, using fewer resources, than it takes to force-fit an off-the-shelf solution into *your* organization. And because the SAS System has its own built-in strategy for client/server, you can integrate data and applications from different hardware platforms into a single, company-wide information delivery system.

Build applications that incorporate pull-down windows...access to electronic mail...drill down, hotspotting, and exception reporting...and graphical display of critical success factors. Working hand-in-hand with these basics—out of sight but always at the ready—are literally hundreds of powerful, proven tools for virtually every decision support need: financial planning and modeling, corporate reporting, quality improvement, and much more.

Take 30 Days to See, and Decide, for Yourself

Let the SAS System help you reach the right decision about applications development, EIS, and every other issue important to your business. Call us now at **919-677-8200** for a free video preview...plus details about a no-risk software evaluation and upcoming SAS System business briefings.

The SAS System.
The World's Leading Information Delivery System.

SAS®

SAS Institute Inc.
Sales and Marketing Division
SAS Campus Drive □ Cary, NC 27513
Phone 919-677-8200 □ Fax 919-677-8123
In Canada, Phone 1-800-363-8397

SAS is a registered trademark of SAS Institute Inc.
Copyright © 1994 by SAS Institute Inc

Users reap benefits of vendor service/support battle

By Jaikumar Vijayan

With product differentiators fading fast in an industry that most observers agree is becoming rapidly commoditized, desktop users are beginning to get an increasing level of service and support as vendors try to outdo one another.

In the past few weeks alone, for instance, several desktop vendors — including Dell Computer Corp., Gateway 2000, Inc. and Zenith Data Systems — joined a growing list of companies offering three-year warranties. These manufacturers also offer service options ranging from next-business-day service to on-site agreements and remote diagnostics.

Another option that is becoming popular is a so-called self-maintainer contract. With this, the customer gets maintenance training from the vendor. Typically, the vendor pays the user each time a failure occurs. Dell, for example, pays customers $75 per incident. Though it involves more in-house effort than the traditional route of farming the computers out to a vendor or a third party, users can save money.

A desktop trend

Often coming at little or no extra cost to the user, these service and support offerings are indicative of a growing trend in the desktop industry, analysts said.

"The difference, really, is that customers today have an option to choose the level and kind of support they want and pay for only what they think they can afford," said Jim Marra, manager of networking at Brigham and Women's Hospital in Boston.

"There isn't all that much to differentiate vendors these days, apart from their service and support," said Richard Zwetchkenbaum, an analyst at International Data Corp. in Framingham, Mass.

Mary Beth Welsh

"The total cost of ownership of a PC is becoming important for desktop users," he added. Vendors have begun to focus on this aspect by offering users a slew of options that allow them to mix and match their service and support requirements with their budgets.

Marra is one user who is starting to leverage the flexibility that vendors are increasingly building into their contracts.

Under a self-maintainer program with Compaq Computer Corp., the hospital's primary vendor, Marra's support team has received training from Compaq and currently does its own hardware maintenance and software support. In certain cases, the hospital is reimbursed for labor by Compaq on a per-incident basis. Parts replacement and support were previously handled by a service provider.

"It's worked pretty well for us so far," Marra said. "We are in control of parts availability, we have our own dedicated task force, and we do save money."

Freedom to choose

While self-maintainer programs are still fairly rare in the desktop industry, several vendors have built in multiple layers of service and support, leaving it to the user to choose the appropriate level of service. Typically, these warranties include the following:

- Basic three-year limited coverage.
- Option to upgrade to on-site service in years 2 and 3 for a fee.
- Next-business-day, on-site service in the first year.
- Twenty-four-hour, seven-day, toll-free technical assistance.
- Optional, guaranteed four-hour response time.

"There is a growing emphasis on service and support in the desktop industry. It has become one of the biggest discriminators in the purchasing decision," said Steve Smith, Dell's director of technical support.

Dell, which handles approximately 12,000 to 15,000 support-related calls a day, offers its users a mix and match of service options, including self-maintainer programs. Dell also provides a parts-only contract, under which it replaces any part or product during the coverage period without charge.

Because vendors are increasingly preinstalling software on their systems, they are also expected to offer at least a minimum amount of software support, according to Smith. "There is an implied level of service that a customer has come to expect from a vendor," he said.

Typically, the support includes features such as enhanced call-routing procedures that improve service efficiency and effectiveness, according to Richard Bernard, director of customer services business management at Zenith Data. For example, repeat callers to Zenith Data's support lines are directed to second-tier customer and technical assistance, while technical calls are escalated to product support, engineering and quality groups.

Call for help

Diagsoft, Inc., a Scotts Valley, Calif., manufacturer of diagnostic software for PC systems, has announced an Electronic Technical Support Center (ETSC) that provides users with on-line access to specially trained support professionals. Using its QAPlus/Win software package and a modem, users can dial in to ETSC for about $2 a minute. Information about the user's system is automatically downloaded into ETSC systems, and questions relating to basic software or hardware problems are resolved on-line.

IBM sees settlement helping OS/2

Terms may trigger system sales

By Ed Scannell
and Jaikumar Vijayan

■ Microsoft Corp.'s settlement with the U.S. Department of Justice may finally enable OS/2 to take a bigger bite out of Windows' market share. At least that is the hope of IBM's Personal Software Products unit.

ANTITRUST SETTLEMENT

The unit is scheduled to deliver a 4M-byte version of OS/2 — something on the wish lists of OEMs and users for years — in September. That delivery, coupled with generous licensing terms, makes IBM executives believe that their chances for winning bundling deals have improved considerably.

Sales of OS/2 2.1 have remained steady since last year, bringing the installed base of the 2.x series to just over 5 million. But Windows continues to outsell OS/2 at a 10-1 ratio. Windows 3.x sales topped the 50 million mark in late May.

IBM executives are clearly hoping to turn those figures around. "As Microsoft offers these OEMs a better volume deal [under new one-year contracts], we'll be right there to offer them a better deal," said Lee Reiswig, president of the Personal Software Products unit.

The unit has already approached several OEMs in the past few weeks with aggressive licensing agreements for OS/2 that company officials are confident will land them some much-needed exclusive bundling deals. Company officials claimed they were met with a majority of favorable responses.

A bundle of promise

The outlook on bundling deals does seem to be brightening for the unit. For instance, Wyse Technology, Inc. will soon start bundling a variety of OS/2 versions, including OS/2 for SMP, on many of its PCs, servers and multiprocessor systems. Compaq Computer Corp. this week will start making OS/2 available as part of its SmartStart program.

"With this deal we think we can offer better cost and performance advantages to what we believe is a growing base of OS/2 users," said Jeff McNaught, director of marketing and management at Wyse's Systems Division.

The situation overseas also appears to be improving somewhat. IBM expects to announce a deal with Munich, Germany-based Escom AG, the country's second-largest PC maker, to bundle OS/2 on all of the 500,000 PCs the company expects to ship next year.

Similarly, Hong Kong manufacturer Genon Technology has signed a three-year deal that allows it to ship OS/2, OS/2 for Windows and PC DOS 6.3 on all of its PCs.

Not enough

Some users, however, were doubtful that the Microsoft settlement would make much of a difference for OS/2. While many have praised its technical features, OS/2 still has few 32-bit applications that truly exploit those features.

"People are purchasing best-of-breed operating systems. OS/2 has been praised as a superior [operating system], but for some reason users have not moved toward it," said David Pinkard, a technical consultant at Mallinckrodt Medical, Inc. in St. Louis.

While Pinkard and some other users welcome the 4M-byte OS/2, Pinkard said much of his decision hinges on how capable the product turns out to be compared with Microsoft's 32-bit Chicago operating system.

But while the settlement with the Justice Department has eliminated a roadblock or two, it also means IBM will have fewer excuses to fall back on if it fails to land any significant deals.

"In some ways there may be a little more pressure on us. We have to make it work," said Wally Casey, marketing director at the IBM unit.

Borland turns up database heat with Paradox 5.0

By William Brandel

■ In an effort to counter the inroads that Microsoft Corp. has made in the PC database market, Borland International, Inc. is preparing to launch a new version of its Paradox for Windows database.

Version 5.0 represents a much-enhanced upgrade from Paradox for Windows 4.5, analysts and beta testers said. The new version runs noticeably faster, according to Michael Lant, president of Avalon Associates, a database consultancy in Toronto. Also, Version 5.0 is said to be easier to use for programmers and end users.

Version 5.0 is a big step forward for Borland because it supports a number of de facto industry standards in the Windows application market, said Nicole Roth, an analyst at International Data Corp. in Framingham, Mass. The update includes support for SQL, Microsoft's Open Database Connectivity (ODBC) and Object Linking and Embedding (OLE) 2.0.

For example, Borland used its not-yet-delivered Object Component Framework classes and libraries to install a bevy of OLE 2.0 functions in the new version, which will also support OLE 2.0 as a client and server.

As a result, users can embed a table from Paradox in a word processor that supports similar OLE 2.0 functions. Alternatively, an object from another application can be embedded in Paradox. By comparison, Microsoft's Access 2.0 database supports OLE 2.0 only as a server.

Other features make the product more appealing to end users, Roth said. Currently, 20% of Paradox's users are end users, she said. It is crucial that Paradox reach beyond this base as it faces strong competition from Access 2.0, which has made inroads with end users by offering easy-to-use prebuilt database functions called "Wizards."

Borland is countering Wizards with "Coaches," which are interactive tutors (see box), and "Experts," which are used to perform basic database functions such as using mailing labels, creating new forms and generating reports from the database.

"The Coaches and Experts make it much easier for the novice database user," said Bob Davis, a developer and officer at the San Diego Police Department. "Using these, I am much more confident in letting a nonpower user develop their own database."

The product also includes a number of new features for programmers, Lant said. For example, Version 5.0 includes a new adapter, which makes Borland's Integrated Database Application Programming Interface compatible with ODBC-based applications. This is significant, Lant said, because it makes Paradox a compatible front end for popular ODBC-based back-end servers such as Lotus Development Corp.'s Notes.

SQL transfer

"One nice feature for corporate programmers is the local SQL," he said. This feature enables the programmer to write SQL code against local Paradox tables.

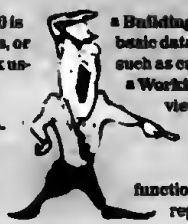
"If you write your SQL code in a local table, you can then take it unchanged into whatever client/server back end you are working with," Lant said. "All you have to do to scale up is point to the right tables."

Paradox for Windows 5.0 is expected to ship at the end of the summer, according to Borland sources. Pricing has not yet been established.

Ask the Coach

A key feature in Paradox 5.0 is what Borland calls Coaches, or interactive tutors that walk users through the following categories:

- **Paradox Basics:** An overview of Paradox functions such as opening files and changing object properties.
- **Building a Database:** Features basic database and table functions such as creating a table.
- **Working with Tables:** Includes viewing and editing records.
- **Queries, Forms and Reports:** Covers steps required to perform basic functions such as printing a report.



[redacted]

Plextor Corp. has announced the 4plex PX-43CH, an internal quad-speed CD-ROM drive housed in an industry-standard half-height 5¼-in. form factor.

According to the Santa Clara, Calif., firm, the 4plex PX-43CH provides users with video, graphics and images that are smoother and more natural than lower-speed drives and can be easily mounted in multimedia PCs.

The 4plex PX-43CH can spin discs at four times the original CD-ROM drive standard. The product has a 600K byte/sec. data transfer rate, a 200 msec random-access speed and a 1M-byte buffer.

An optional SCSI interface lets users daisy-chain up to seven peripherals. An external configuration, 4plex PX-45CH, is also available and can be used in PC and Macintosh environments.

Prices start at $549.

▶ *Plextor*
(408) 980-1838

Four Corners Development Partnership has introduced SuperConductor, software that lets users organize computers and information around people rather than applications.

According to the Sherman Oaks, Calif., company, records created in the central People Screen receive all information added to the record later and store it in the appropriate individual dependent screens.

Related screens for each individual's record include Address, Telephones, Documents, Classifications, Schedules and Members.

Users can write a letter by creating a space for the addressee and calling up the preferred word processing application on that person's Documents screen. SuperConductor automatically saves the file in that person's record.

SuperConductor can interrelate categories and has an integrated scheduler/calendar that works with all subject information.

SuperConductor costs $99.

▶ *Four Corners Development*
(310) 780-3835

Aha Software Corp. has introduced Aha InkWriter for Windows, a word processor for handwriting.

According to the Mountain View, Calif., company, Aha InkWriter lets users of pen-enhanced computers edit and search for handwritten words on the screen.

The product deals with pen input without depending on handwriting recognition and lets users erase, highlight, italicize or bold-face words. Deferred recognition allows users to translate handwriting into computer text at any time, so mistakes do not have to be corrected as users write.

Aha InkWriter automatically provides the correct editing and formatting options for each type of writing.

Aha InkWriter costs $199.

▶ *Aha Software*
(415) 988-2050

Software Publishing Corp. has introduced Harvard Spotlight for Windows, an electronic presentation delivery product.

According to the Santa Clara, Calif., company, Harvard Spotlight lets users organize, rehearse and deliver existing electronic presentations more effectively.

After creating slides in any of the leading presentation packages, users can convert the presentation with an automatic capture capability.

The product was specifically designed to let presenters control the flow and delivery of electronic presentations. Features include a customizable control panel, a slide locator to change the slide order during a presentation and a timing feature that lets the user set the time for an entire presentation.

Users can run practice sessions and compare their times with the time allocated for the presentation.

Harvard Spotlight costs $99.

▶ *Software Publishing*
(408) 986-8000

Aldus Corp. has announced ChartMaker, a software module from the company's Aldus Accessory Products line.

According to the Seattle company, ChartMaker is a full-featured Microsoft Corp. Object Linking and Embedding (OLE) product providing a range of charting functions directly within a user's primary application.

Users can create a chart with either native Microsoft Excel data or the datasheet built into ChartMaker. A link is retained between every chart and its data so calculations are instantly executed when changes are made.

ChartMaker provides 84 distinct two- and three-dimensional chart types and comes with a variety of predesigned chart templates. The product displays line and bar charts either vertically or horizontally with absolute, stacked, bipolar or dual-axis options.

Object attributes can be revealed when the object is selected with a mouse, while an eyedropper tool can pick up an object's color and apply it to other objects.

ChartMaker costs $149.

▶ *Aldus*
(206) 622-5500

MicroLogic Software, Inc. has announced PrintMaster Gold CD Bonus Pack, an entry-level publishing product.

According to the Emeryville, Calif., company, PrintMaster Gold CD Bonus Pack uses a talking interface to guide users through the selection of ready-made projects.

The product includes 145 TrueType fonts and more than 1,000 color clip-art images for creating greeting cards, banners, calendars, signs and stationery.

The PrintMaster Gold CD Bonus Pack costs $79.

▶ *MicroLogic Software*
(510) 652-5464

Product short

Lanier Worldwide, Inc. has announced the Lanier 4200 color printer, which uses high-resolution thermal-transfer technology to print up to four times faster than ink-jet systems. It requires no drying time and eliminates smearing, wrinkling and curling. The Lanier 4200 provides full-color printing from all IBM-compatible PCs running Windows 3.1 and comes with a Windows printer driver. Cost: $1,195. Lanier Worldwide, Atlanta, Ga. (404) 496-9500.

Fill it out, fax it in. Save $8

FAX NO. 508-626-2705

Yes, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $39.95* per year - a savings of $8.00 off the basic subscription price.

First Name MI Last Name

Title Company

Address City State Zip

Address Shown ❑ Home ❑ Business ❑ New ❑ Renew Basic Rate $48 per year

* U.S. Only. Canada $95, Mexico, Central/South America $150, Europe $295, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)

10 Manufacturer (other than computer)
20 Finance/Insurance/Real Estate
30 Medical/Law/Education
40 Wholesale/Retail/Trade
50 Business Service (except DP)
60 Government - State/Federal/Local
65 Communications Systems/Public Utilities/ Transportation
70 Mining/Construction/Petroleum/Refining/Agric
80 Manufacturer of Computers, Computer Related Systems or Peripherals
85 Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90 Computer/Peripheral Dealer/Dist./ Retailer
95 Other_____ (Please Specify)

2. TITLE/FUNCTION (Circle one)

IS/MIS/DP MANAGEMENT

19 Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21 Dir./Mgr. MIS Services, Information Center
22 Dir./Mgr. Network Sys. Data/Tele. Comm., LAN Mgr. /PC Mgr. Tech Planning, Admin Svs.
23 Dir./Mgr. Sys. Development, Sys. Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D Tech. Mgt.
60 Sys. Integrators/VARs/Consulting Mgt.

CORPORATE MANAGEMENT

11 President, Owner/Partner, General Mgr.
12 Vice President, Asst. VP
13 Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT

51 Sales & Mktg. Management
70 Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT

80 Information Centers/Libraries, Educators, Journalists, Students
90 Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

Recyclable Paper

COMPUTERWORLD

E4431-0

Fill it out, fax it in. Save $8

FAX NO. 508-626-2705

Yes, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $39.95* per year - a savings of $8.00 off the basic subscription price.

First Name MI Last Name

Title Company

Address City State Zip

Address Shown ❑ Home ❑ Business ❑ New ❑ Renew Basic Rate $48 per year

* U.S. Only. Canada $95, Mexico, Central/South America $150, Europe $295, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)

10 Manufacturer (other than computer)
20 Finance/Insurance/Real Estate
30 Medical/Law/Education
40 Wholesale/Retail/Trade
50 Business Service (except DP)
60 Government - State/Federal/Local
65 Communications Systems/Public Utilities/ Transportation
70 Mining/Construction/Petroleum/Refining/Agric.
80 Manufacturer of Computers, Computer Related Systems or Peripherals
85 Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90 Computer/Peripheral Dealer/Dist./ Retailer
95 Other_____ (Please Specify)

2. TITLE/FUNCTION (Circle one)

IS/MIS/DP MANAGEMENT

19 Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21 Dir./Mgr. MIS Services, Information Center
22 Dir./Mgr. Network Sys. Data/Tele. Comm., LAN Mgt. /PC Mgr. Tech Planning, Admin Svs.
23 Dir./Mgr. Sys. Development, Sys. Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D, Tech. Mgt.
60 Sys. Integrators/VARs/Consulting Mgt.

CORPORATE MANAGEMENT

11 President, Owner/Partner, General Mgt.
12 Vice President, Asst. VP
13 Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT

51 Sales & Mktg. Management
70 Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT

80 Information Centers/Libraries, Educators, Journalists, Students
90 Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

Recyclable Paper

COMPUTERWORLD

E4431-0

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
P O BOX 2044
MARION OHIO 43306-2144

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
P O BOX 2044
MARION OHIO 43306-2144

Unix PCs strengthen pharmacy chain

Rite Aid update expands access to sales, prescription data

By Jean S. Bozman

Next month's completion of a 2,690-store systems rollout will enable drug store giant Rite Aid Corp. to fill prescriptions throughout its network of stores and make buying decisions based on current sales data.

The information systems revamp is in step with Rite Aid's fiscal 1994 decision to refocus on its pharmacy business and sell its nonpharmacy business units. The older store systems were unable to support many of the real-time business functions needed to maintain the retail pharmacy business. It took all night to conduct a network poll of DOS-based PCs in each store, for example.

"We were looking to accomplish a single point of connectivity from the stores," said Bob Kostosky, director of store technology for the national rollout. "The whole purpose of having a higher availability of information is to make better decisions."

Without quick access to stores' inventory and sales information, Rite Aid could not make decisions based on timely data, IS managers said. "If we wanted to get a piece of information at [noon], we couldn't get it," Kostosky said. "You only had one opportunity per day per store to get an update."

Calling home

Rite Aid decided two years ago to replace its DOS-based Intel Corp. 80286 PCs with PC-based Unix servers that could interact with headquarters' mainframes all day. The new Unix servers are based on Intel 386 and 1486 PCs running The Santa Cruz Operation's SCO Unix operating system.

Benefits include earlier feedback about sale items and new items in the stores. Although 600 stores had some degree of automated inventory tracking with the old systems, all store computers will now be able to track inventory. The on-line system is expected to reduce inventory stored in warehouses and eliminate manual order-writing. The new system also enables any Rite Aid store to fill prescriptions stored in mainframe database files at the central site near Harrisburg, Pa.

Combined with the installation of VSAT satellite links to each store, the new systems will help sharpen competition against other retail pharmacy chains such as Consumer Value Stores in Woonsocket, R.I., Revco Drug Stores, Inc. in Twinsburg, Ohio, and Eckerd Drug Co. in Clearwater, Fla., Rite Aid managers said.

Unlike the older DOS-based PCs, the SCO servers will juggle multiple tasks, posting all store sales, tracking inventory and supporting local store applications. A typical store server will support four to eight cash registers, several radio frequency handheld terminals to track inventory, several pharmacy terminals and a store manager's terminal (see chart below). The old PCs handled one task at a time and required employees to re-enter data from multiple cash registers.

The VSAT links provide two-way communications, enabling store managers to tap mainframe data. "Each store can dial in and see their own information," said Wayne LeClair, director of training for Rite Aid's retail stores. "Regional managers are able to look at [results from] all their stores."

Training time is expected to increase with the new systems, he added. Employees will need to learn about new applications that access host data.

Rite Aid's effort to revamp the store systems dates back to 1991 when DOS applications were converted to run under Unix. Because there were no DOS-specific systems calls, porting 600 software modules from DOS to Unix took less than three months.

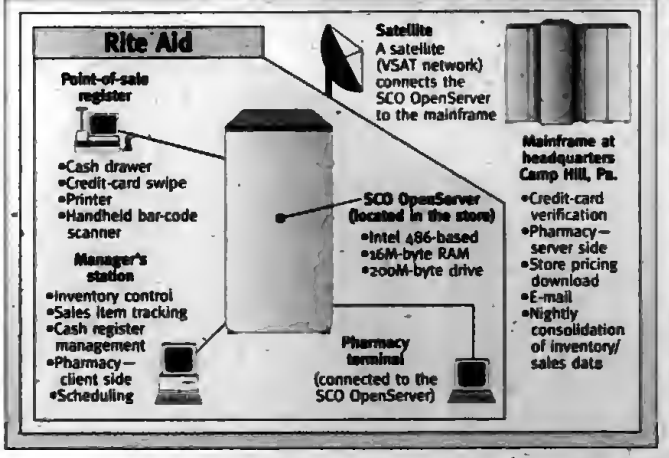
The Unix distributed systems were designed to run without a local systems administrator and to alert the central mainframe in case of trouble. Rite Aid "built the tools to let the machine administer itself," Kostosky said, including managing the size of data files, overseeing user logging activity and handling automated backups.

Stirring the batch

The overhaul will also include updating central-site applications software. Applications running in a batch update mode will be converted for use with real-time store updates. Users will access IBM CICS screens and view database extracts from IBM's DB2 relational database running on one of two mainframes. In-store Unix servers will run a flat-file ISAM-style database at first, although relational databases may be added later.

"We're now in the process of reengineering the applications, both on the mainframe and in the stores, to take better advantage of the higher availability of data," Kostosky said.

SCO OpenServer solution at Rite Aid



ON SITE

Rite Aid Corp.
Camp Hill, Pa.

Challenge: To provide a better window on sales at Rite Aid's 2,690 retail stores in 23 Eastern states; to have two-way interactive data query between store servers and mainframes.

Strategy: By replacing DOS with a Unix operating system on Intel PC servers, Rite Aid plans to gain cost-effective store servers that can juggle multiple tasks. The installation of an enterprisewide VSAT satellite network was designed to establish real-time connections between stores and headquarters.

Results: Completion of an enterprisewide rollout of the new systems is expected in September, allowing two-way data transfers on an as-needed basis.

Briefs

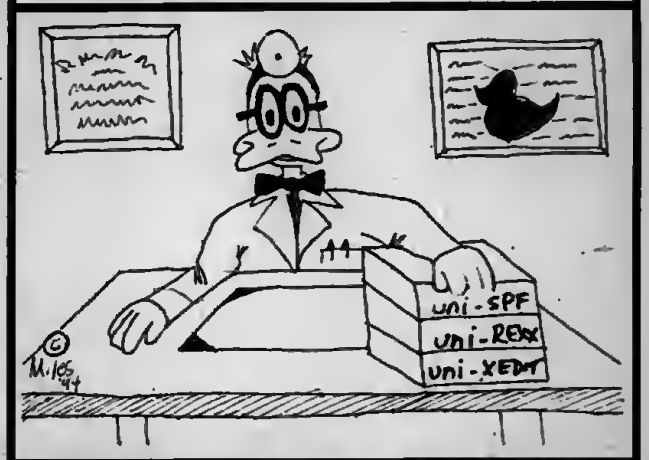
Dell gives Rumba a try

Dell Computer Corp. will offer Wall Data, Inc.'s Rumba products as part of its ReadyWare program to provide customers with factory-installed hardware, software and peripherals. Dell will also incorporate Rumba products into Medical Desktop, its customized computer for the medical community. Rumba provides simultaneous and transparent connections to host environments from a single Windows workstation.

EDS wins Hughes desktop deal

Electronic Data Systems Corp. won a five-year deal to provide distributed systems management for fellow General Motors Corp. unit Hughes Space and Communications Co. EDS will manage 4,000 desktop systems and Hughes' LAN-based computing environment. EDS said it beat AT&T Corp., Computer Sciences Corp., Digital Equipment Corp., Hewlett-Packard Co. and IBM subsidiary Integrated Systems Solutions Corp. EDS did not disclose the value of the deal.

Suffering from a migration headache because of vi and other Unix ailments? Take two of these and call us in the morning.



wrk/grp
the workstation group
the business choice for open systems
1-800-228-0255

High performance 486™DX2. Blazing 66MHz, backed by our exclusive turbo cache, for unparalleled workstation performance.

Two Full-length ISA Slots. Connections are everything. And this machine allows for plenty—Ethernet, video, you name it.

Optional Built-in 5.25" CD ROM. The medium with capacity for video clips, graphics, photo CDs, or an entire set of manuals.

PCMCIA Expandability. The T6600C offers a huge wealth of communication and expansion options, including a 16mm PCMCIA 2.01 compliant slot large enough for a hard drive!

Built-in Stereo Speakers. Quality audio adds another dimension to any program. With Microsoft® Microphone™ included, your work can speak for itself.

A technological tour de force that actually tours.

Take your entire show on the road. The Toshiba T6600C Series represents the most advanced technology and muscle we've ever put into a portable. With its 486™DX2 processor, dual ISA full-slot expansion, and huge storage options, the T6600C Series delivers the power and capacity for the most demanding portable applications. From network analysis to software development to full-blown multimedia, if you need to tour with a great deal of force, this is your system.

Feel the force. **For your nearest dealer, call 1-800 457-7777.**

The T6600C Series

- Intel 486™DX2/66MHz
- 8MB RAM expandable to 40MB RAM
- 10.4" color active matrix TFT-LCD screen
- SVGA display with 640x480x256 color resolution
- 510MB HDD
- Two full length 16-bit ISA slots
- One 16mm PCMCIA slot
- Built-in SCSI with external SCSI-II port
- Microsoft® Sound System™
- 5.25" half height 200ms double speed CD-ROM (T6600C/CD model only)

intel inside

In Touch with Tomorrow

TOSHIBA

© 1994 Toshiba America Information Systems, Inc. The Intel Inside logo is a trademark of Intel Corporation. All products indicated by trademark symbols are trademarked and/or registered by their respective companies.

Jeffrey Henning

Load sharing is in your future

You are wasting at least 76% of your investment in desktop computing hardware. You could more than quadruple the computatinnal power available to your organization if you simply made better use of your hardware.

In fact, if you made better use of your desktop hardware, you could slash your investment in additional computers and even eliminate some currently installed midrange and mainframe computers altogether. The only reason no one has brought this to your attention before is because almost every company has the same problem and has found no way to change the situation.

You have invested in PCs and workstations that are used 40 out of the 168 hours in each week at most. This leaves 128 hours — 76% of the time — when those systems are not in use. The situation may actually be worse: Many of those computers may be in use for only 20 hours per week, although they will be on while their users attend meetings, talk on the phone and get coffee. All the while, their CPUs spin idly. You're wasting supercomputers' worth of MIPS.

> Your PCs and workstations are only in use 76% of the time. You're wasting supercomputers' worth of MIPS.

Spread the load around

A young Canadian company has decided to do something about that. Platform Computing Corp. has developed software that can help you maximize the use of desktop computers. Platform's Load Sharing Facility (LSF) can distribute batch jobs across a network and supports interactive load sharing and parallel computing. The limit: Right now it is primarily available for Unix-based workstations such as those running San Microsystems' SunOS, Hewlett-Packard's HP/UX, Digital's Ultrix, IBM's AIX and the Open Systems Foundation's OSF/1. However, a Microsoft Windows NT version is planned. Still, LSF can help you take advantage of your workstation hardware today.

LSF is a layer that runs above operating systems and network servers and provides seamless interoperability on heterogeneous platforms. LSF will automatically distribute batch jobs to all available and suitable computers. If it is the end of the day, all the workstations on a LAN could kick in to handle different batch jobs. During the workday, only systems not in use would process these batch jobs. Users' need for their systems always takes precedence, and any executed batch job will be suspended or run in the background while the users perform their work.

LSF is a spiritual descendent of mainframe-derived load-balancing products such as IBM's Network Queuing System. Because those products do not suspend jobs when a user comes back to his system — monopolizing a workstation until a batch job is completed — they are inappropriate for use during the workweek. Additionally, they lack the breadth of support for multiple operating systems that LSF offers. LSF can better harness the potential of a network of heterogeneous workstations.

Real-life tests

Users of LSF are leveraging their existing hardware investments. Bell Northern Research has reported about a 35% improvement in response time for its applications. Pratt & Whitney found that one type of calculation ran 20 times faster distributed across a Unix cluster than on a supercomputer. Pratt & Whitney is even using LSF to distribute jobs not just on the LAN but on a wide-area network so that computers in Hartford, Conn., and West Palm Beach, Fla., can seamlessly process a user's job that originated at a site in Canada. LSF has even helped Pratt & Whitney get rid of a Cray supercomputer.

To be realistic, LSF is no panacea. Because it works only with Unix, it is not going to turn your Windows PC network into a supercomputer any time soon. Additionally, it does not work well for all types of applications. If you have one enormous batch job, and it cannot be subdivided at all, then it will not benefit from LSF or any other load-sharing technology.

If you have a job that requires processing significant amounts of data, it will degrade your network performance because transferring the data to the available workstation across the network via Network File System is slow. If a job requires high security, you're not going to want to distribute its data to workstations across the network. Within these limits, load-sharing technology offers tremendous potential and promises to unleash CPU power in the future even faster than Moore's Law has in the past.

Load-sharing technology is a revolution in the making. Much talk has centered on the use of networks for data sharing, but load-sharing technology goes beyond providing data sharing by providing CPU sharing. In the 1960s, thanks to terminals, everyone at a site might have been sharing one computer's CPU. In the 1980s, everyone had a CPU of their own. In the late 1990s, everyone will have access to their colleague's CPU as well as their own.

Henning is the associate director for personal systems and software publications at BIS Strategic Decisions in Norwell, Mass. He can be reached on the Internet at 649-6654@mcimail.com. On MCI Mail, send to 649-6654.

LAN outsourcing vendors lose sight of users' needs

By Steve Moore

Vendors of nearly every stripe are leaping eagerly into the remote LAN management business. But they do not appear to be looking carefully at users' concerns before they leap.

"People have been talking about outsourcing LAN management for over a decade now, but vendors haven't proved they can provide this service remotely in a manner that exceeds the internal capabilities of the customer at a lower cost," said Jeffrey Kaplan, a director at Dataquest Worldwide Services Group in Framingham, Mass.

While outsourcing of what Dataquest calls LAN management and operations services is expected to grow, that growth will not be realized for several years because it will take time for users to become more comfortable with outsourced LAN management.

Do users want it?

The newly emerging Desktop Management Interface (DMI) standard by the Desktop Management Task Force is expected to enable users to manage LAN-attached PCs remotely — if the standard gains sufficient support from vendors of desktop hardware and software. Users will be able to remotely perform software distribution and configuration and performance management, but many are not convinced they want to do that.

One network manager said he will defer judgment until sophisticated remote LAN management services are a widely accepted reality, not just an idea.

"It sounds like Centrex data," said Dennis Maloney, director of telecommunications services at the University of Colorado in Boulder. He was referring to carrier-provided voice network management services, which have fallen out of favor among users.

Maloney said DMI-based remote LAN management would duplicate the internal data network management and security capabilities the university relies on.

How comfortable are you with outside vendors monitoring your LANs remotely?

Very comfortable	10.4%
Comfortable	15.5%
Uncomfortable	21.7%
Very uncomfortable	27.8%
No opinion	24.6%

Base: 200 IS managers and network managers

Source: Dataquest Worldwide Services Group, Framingham, Mass.

Analysts point to several barriers to effective LAN management outsourcing. "Once things standardize, they tend to commoditize, and then they tend to be candidates for outsourcing," said Mike Marburg, an analyst at Meta Group, Inc. in Reston, Va. However, LAN management today is still distributed across the enterprise, and "outsourcing doesn't happen until it becomes a centralized [information technology] function," he added.

A matter of trust

In addition, because many businesses see client/server applications as highly strategic, "users have to believe it's in their interest to outsource that level of management to a third party," said John Morency, a principal consultant at Strategic Networks Consulting, Inc. in Rockland, Mass.

Morency added that because DMI-compliant products are unlikely to be delivered in quantity before mid-1995, it could be late

LAN management, *page 44*

Growth market

The market for LAN management and operations services (remote and on-site) will grow at a compound rate of 17.6% through 1998, according to Dataquest Worldwide Services Group. New research indicates the market will expand from $1.5 billion in 1993 to $3.3 billion in 1998, said Jeffrey Kaplan, a Dataquest director.

DEC unveils strong workstations, despite troubles

By Mary Brandel

■ The turmoil surrounding Digital Equipment Corp. seems to have had little effect on its workstation group, which recently released two technical workstations — a high-end and a mid-range model — that secure the company's position as the price/performance leader.

The DEC 3000 Model 700, a desktop model with a 225-MHz Alpha AXP processor, is intended for two- and three-dimensional design applications such as scientific visualization and high-end financial modeling.

The 3000 Model 900 is a 275-MHz machine intended for structural engineering, structural biology and solid-state and condensed-matter physics.

"I'm pleasantly surprised with the 700," said Joseph Pollizzi, project engineer at the Space Telescope Science Institute in Baltimore. "I was going to buy a 600 but will change the purchase order for a 700."

Observers were also pleased with the repricing of the older 175-MHz 600 to $17,495. "Moving [the 600] below $18,000 really brings a lot of performance into that mainstream workstation line," said Dominic Richetti, an analyst at Dataquest, Inc. in San Jose, Calif.

Users can upgrade from the Model 600 to the 700 for $5,995.

Pollizzi said he was less thrilled with the 900, which is slated to replace the Model 800, a 200-MHz workstation that starts at $36,000. "If they're getting rid of the 800 but increasing the 900 by that much money, it's a mistake," he said. "We can't go that high when the only increase was CPU speed, and there was no additional TurboChannels or I/O."

Users of the Model 800 can upgrade to the 900 for $8,995.

With Digital's current troubles, this type of announcement could well be overlooked "but not by its competitors," said Terry Shannon, an analyst at Illuminata in Hollis, N.H.

"I don't think IBM, HP or the other high-performance competitors have a response until later this year," Richetti agreed.

DEC 3000 Model 700 AXP

Price: $27,698 to $40,000
CPU: 225-MHz
SPECfp92: 230.6
SPECint92: 162.6
TurboChannel slots: three at 100M byte/sec.
Memory: 64M bytes
Disk: 1G byte
Availability: August

DEC 3000 Model 900 AXP

Price: $43,373 to $75,000
CPU: 275-MHz
SPECfp92: 264.1
SPECint92: 189.3
TurboChannel slots: six at 100M byte/sec.
Memory: 64M bytes
Disk: 2G bytes
Availability: August

Up their sleeves

Hewlett-Packard Co. just announced a 125-MHz workstation a few months ago, Richetti said, and IBM has not been as aggressive in pricing as Digital or HP. Sun Microsystems, Inc., he added, depends on multiprocessing for this type of performance, "which is not developing well for desktop applications."

Silicon Graphics, Inc. (SGI) "may be more of a wild card here," Richetti said. SGI announced the R8000 chip, a high-performance floating-point multichip set that is due out this summer or fall. However, "It will take some time for it to come into these lower price ranges," he said.

Despite its leadership price/performance, Digital is fourth behind Sun, HP and IBM in unit shipments, according to Dataquest.

Both of the announced workstations sport the new ZLX-E graphics accelerator from Digital.

The company also announced the Advantage Cluster Compute, a cluster of four rack-mounted DEC 2100 servers.

Because the DEC 2100 expands to four processors, this new system can expand to 12 processors and 800G bytes of disk storage in a single rack. With load-sharing software, users can run supercomputer applications faster with the system, giving them what the vendor claimed is "an effective alternative to supercomputers" at $200,000 to $300,000.

LAN management debate continues

By Steve Moore

McAfee Associates, Inc. recently said it will push its LAN management interfaces as industry standards that will allow client PCs to provide consistent information about themselves to server-based LAN management applications.

McAfee President Bill Larson said the firm this fall will offer its LANOpen interface for adoption as part of the Desktop Management Interface (DMI), a standard being developed by the Desktop Management Task Force (DMTF).

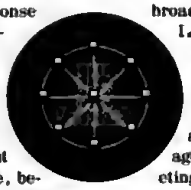
"The value of what McAfee is trying to accomplish is that if there's a common interface for the [remote use] of the DMI across LANs, then any number of management applications can compete," said Chris Thomas, DMTF chairman and manager of technology and alliances at Intel Corp.

With such a common interface, he said, DMI would provide standardized information about hardware and software inside each client PC. Different types of LAN management applications would then compete on application-specific features such as graphical user interfaces.

Nothing on the table

"There haven't been any official proposals from McAfee or anyone else yet," Thomas said. "They should join the DMTF and work with us. We welcome them in that regard." He noted that others working on remote LAN management interfaces include Hewlett-Packard Co., Spry, Inc. and Intel.

The LANOpen specifications can be used in software or firmware. McAfee, based in Santa Clara, Calif., claims that if LANOpen is implemented in flash programmable read-only memory, it will conserve a PC's memory and system resources. By doing so, PCs will provide faster response times for LAN management applications written to support LANOpen.



"You can see 30% to 50% performance gains when you put things into firmware, because of the faster processing speeds," said Bob Johnson, an analyst at Dataquest, Inc. in Framingham, Mass. "McAfee will have to quantify those [processing speed] savings for people to justify embracing the technology."

One monitor too many

"I'm less concerned about offloading the CPU and more concerned about off-loading the memory," said Katherine Epes Barrett; a consultant at International Finance Corp., a member of the World Bank Group in Washington. However, she added, "it's all well and good to have it out of the user's memory. But if I have to put yet another monitor up in my network control center, it's not going to be exactly what I have in mind."

Rather than being confronted with another separate monitor screen, users will likely have to monitor an additional window within an existing integrated systems/network management application from HP or Tivoli Systems, Inc., for example, Larson said.

Eventually, he added, McAfee plans to offer LANOpen firmware aimed at standardizing the collection of desktop information for a broad range of server-based LAN systems management applications, including software distribution and license metering, inventory and configuration management and trouble ticketing.

Some users question the need for far-reaching LAN systems management standards, whether in firmware or software. "We have a hard enough time just knowing if things are up at all, let alone dealing with all this extended [systems management] stuff," said Larry Kreighbaum, senior computer facilities analyst at Amoco Corp. in Tulsa, Okla.

While new firmware might have its place in some devices, he added, it is not needed for computers "that already have enough processing power to run an agent." Larson said the new firmware will be useful in the large installed base of older, less powerful PCs.

"It's important that we do not manage the open [application programming interface]. If a vendor does that, its openness is called into question," Larson said.

LAN management

CONTINUED FROM PAGE 43

1996 before vendors gain experience using such products in their outsourcing schemes.

Security is also a looming concern for network managers.

"I would want to be sure that no DMI agent controlled from an outside source could be allowed to cruise through my financial database," said John McConnell, president of McConnell Consulting, Inc. in Boulder, Colo. Yet he added that DMI would likely play "a tremendous role internally" because it will let organizations centralize and consolidate systems management functions.

Other users said human factors must also be kept in mind.

"A LAN manager's job is much more than just the technical part of it. It's also the interpersonal communication between the users and the LAN management staff," said Mike Garrett, a network administrator at the Mellon Bank in Pittsburgh.

Things to ponder

Before users jump on the remote LAN management bandwagon, Morency observed, they should find answers to the following questions:

- What portion of the DMI standard is going to be supported by each vendor's products?
- How will DMI interoperate with the Simple Network Management Protocol?
- When will DMI be fully supported by enterprise network management systems such as Hewlett-Packard Co.'s OpenView or IBM's NetView?

In the long run, DMI has tremendous potential for managing remotely, said Frank Dzubeck, president of Communications Network Architects, Inc. in Washington.

"You'll know before the user does when he needs a bigger hard disk or a new PC," Dzubeck said. "You also may find that the software you've been buying for years is not performing as well as it should."

Companies converging on the remote LAN management market today include major computer vendors such as IBM and HP; networking vendors such as Banyan Systems, Inc. and Crosscomm Corp.; and others including Electronic Data Systems Corp., Computer Sciences Corp., Infonet Services Corp. and Vanstar Corp.

Since you can't make your competition's communications worse, why not make yours better?

Wouldn't it be great if there was a way your company could achieve this same sort of almost-unfair advantage over the other guys just by improving your own communications system? Well, there is. Call Ameritech. We have a history of creating solutions for a variety of business problems. We can design a system that keeps your company accessible to all of your customers all of the time. Welcome to the passing lane on the information highway. To find out how to get into it, call 1-800-719-5822, extension 16.

Ameritech

Your Link To Better Communication

UK bank spin-off launches workflow software winner

By Elizabeth Heichler
LONDON

National Westminster Bank PLC recently released custom-developed workflow software as a commercial package called Integrated Work.

The UK bank's computing subsidiary, Centre-file Ltd., built the Microsoft Corp. Windows NT-based package for National Westminster's customer service centers as part of a business process improvement project. The subsidiary plans to sell the workflow application in the UK and the U.S.

"We decided to develop the software because no workflow system in the market was sufficiently robust and scalable for [the bank's] needs," said Noel Dearing, managing director at Centre-file.

The workflow system has scaled to 600 client workstations and 23 Windows NT servers. In addition, the business process redesign that the software implements saves the bank more than $4.5 million annually, Dearing said. Priorities for the system were that it work with the existing information technology infrastructure and that it have a strong security system, he added.

The central component of Integrated Work is WinWork, a software tool kit that designs workflow patterns for business processes. WinWork takes over the management of patterns that serve as a workflow engine. It offers facilities for integrating to existing systems and elements such as image-processing equipment.

The modules available with WinWork handle document production, print management, document image processing, output to laser disc for mass information storage and retrieval, optical character recognition, fax integration, call center management, legacy systems integration and security.

The company hopes to have a Unix version of Integrated Work available in the first quarter of next year, officials said.

Moving into the U.S. market will be critical to Integrated Work's success, according to Peter Shephard, marketing director at the bank. "We've got to have a presence in the States pretty quickly, and we're comfortable that with our partners, we'll get a foot in the door."

Trans-Atlantic deals

Microsoft Ltd., Sequent Computer Systems, Inc. and Aspect Telecommunications have strategic marketing relationships with Centre-file for the UK and will work with it in the U.S. as well.

After sales start rolling in the UK, "we are currently building a plan. We'll initiate sales here in the UK and then start building a beta program in the U.S.," said Mark Miller, vice president of marketing at Sequent. The firm is working with Centre-file on its Unix port and also with NT.

Microsoft will examine how it can introduce Centre-file to key independent software vendors and partners in the U.S., said Geoff Hughes, partnership manager at Microsoft Ltd. in the UK.

Heichler is a European correspondent for the IDG News Service.

Briefs

SunSoft updates Interactive

SunSoft, Inc. announced Version 4.1 of its Interactive Unix operating system for Intel Corp. desktop machines at last month's PC Expo '94. The update to Interactive System V/386 Release 3.2 includes support for more PC peripherals and more PC device drivers, as well as support for Novell, Inc.'s IPX/SPX networking protocol stack. Prices for Version 4.1 of Interactive start at $495. Upgrades from older versions cost $99.

MIT spin-off merges

The X Consortium, which spun off from MIT last year, announced it will merge its development and marketing activities with the X Industry Association, which promotes the use of X Window System products. X Consortium president Robert Scheifler said the move is being made to create a push for a standard commercial X-based desktop.

Now there's an easier way to access
without losing touch with y

Keyfile Corp. has announced KeyConnect for Notes, software that allows the company's Keyfile integrated document management system to interoperate seamlessly with Notes.

According to the Nashua, N.H., firm, KeyConnect lets Notes users integrate high-end document imaging and workflow capabilities into Notes desktops and also lets Keyfile users take advantage of Notes communications technology.

With KeyConnect's support for Dynamic Data Exchange and Microsoft Corp.'s Object Linking and Embedding, users can access Keyfile objects from within a Notes application.

KeyConnect provides optional support for Notes' Vendor-independent Messaging (VIM) so Keyfile documents can be sent across an enterprise network or exchanged with any other software package that supports VIM.

KeyConnect costs $795 or $995 with VIM support.

▶ *Keyfile*
(603) 883-3800

Delrina Corp. has announced FormFlow 1.1, electronic forms routing software.

According to the Toronto company, FormFlow 1.1 includes forms data interchange (FDI) and electronic data interchange capabilities, additional database connectivity to Notes through Microsoft Corp.'s Open Database Connectivity and seamless electronic-mail routing support for WordPerfect Corp.'s Office.

The FDI capability integrates the binary file transport capabilities of WinFax Pro 4.0 with FormFlow 1.1 and lets users route forms and data as binary information via fax.

FormFlow 1.1 consists of two components: Designer for creating forms applications and Filler for filling in and routing forms via E-mail and fax.

Prices start at $129.

▶ *Delrina*
(416) 441-3676

Ibex Technologies, Inc. has announced FactsLine for Lotus Notes, fax-on-demand software.

According to the Placerville, Calif., company, FactsLine for Lotus Notes lets Notes users use Notes documents as fax-on-demand documents without printing or manually faxing them.

The product automatically creates fax documents from Notes documents when a caller requests them and caches frequently requested items.

Other features include credit card charging, account number access, call accounting and complete recording. Non-Notes documents can also be scanned or faxed into the system.

Prices start at $6,700.

▶ *Ibex Technologies*
(916) 621-4342

Marin Research has announced Project Gateway, a Windows-based integration product.

According to the Mill Valley, Calif., company, Project Gateway integrates Microsoft Corp.'s Project and Symantec Corp.'s Time Line project management software with Notes.

The product adds importing, exporting and synchronization capabilities to Notes and lets users combine up-to-date project schedule information with specifications, customer correspondence, drawings and methodology.

Project Gateway automatically records project revisions and maintains effort and progress data by time periods.

Prices start at $895.

▶ *Marin Research*
(415) 389-5444

Cayman Systems, Inc. has announced the I series GatorRoute IR and GatorStar IHR workgroup routers.

According to the Woburn, Mass., company, the routers provide two flexible serial wide-area network ports for connection between remote offices and the corporate site via leased line, analog dial-up and digital dial-up. Two Ethernet segments allow for local routing at the branch office.

The routers are compliant with Point-to-Point Protocol, providing a standard for transporting high-level local-area protocols such as IP, Novell, Inc.'s IPX, Digital Equipment Corp.'s DECnet and Apple Computer, Inc.'s AppleTalk over wide-area links.

GatorRoute IR costs $2,495, and GatorStar IHR costs $4,495.

▶ *Cayman Systems*
(617) 932-1100

Product shorts

Mountain Network Solutions, Inc. has announced FileSafe for Windows Rescue NetWare Loadable Module 1.1. It features support for workstation backup, automated backup protection, comprehensive data management capabilities and fast disaster recovery for both client and server applications. Cost: $499. Mountain Network Solutions, Scotts Valley, Calif. (408) 438-6650.... MITI has announced AdHawk, a real-time visual monitoring and diagnostic tool for Oracle Corp. relational database management systems. It analyzes database components and activity to locate system troubles and diagnose their cause, guiding users through each level of system diagnostics. Cost: starts at $999. MITI, Long Beach, Calif. (310) 424-4399.

your Open Systems
our mainframe.

Introducing the HP ENTRIA. The lowest-cost, simplest-to-manage X terminal family.

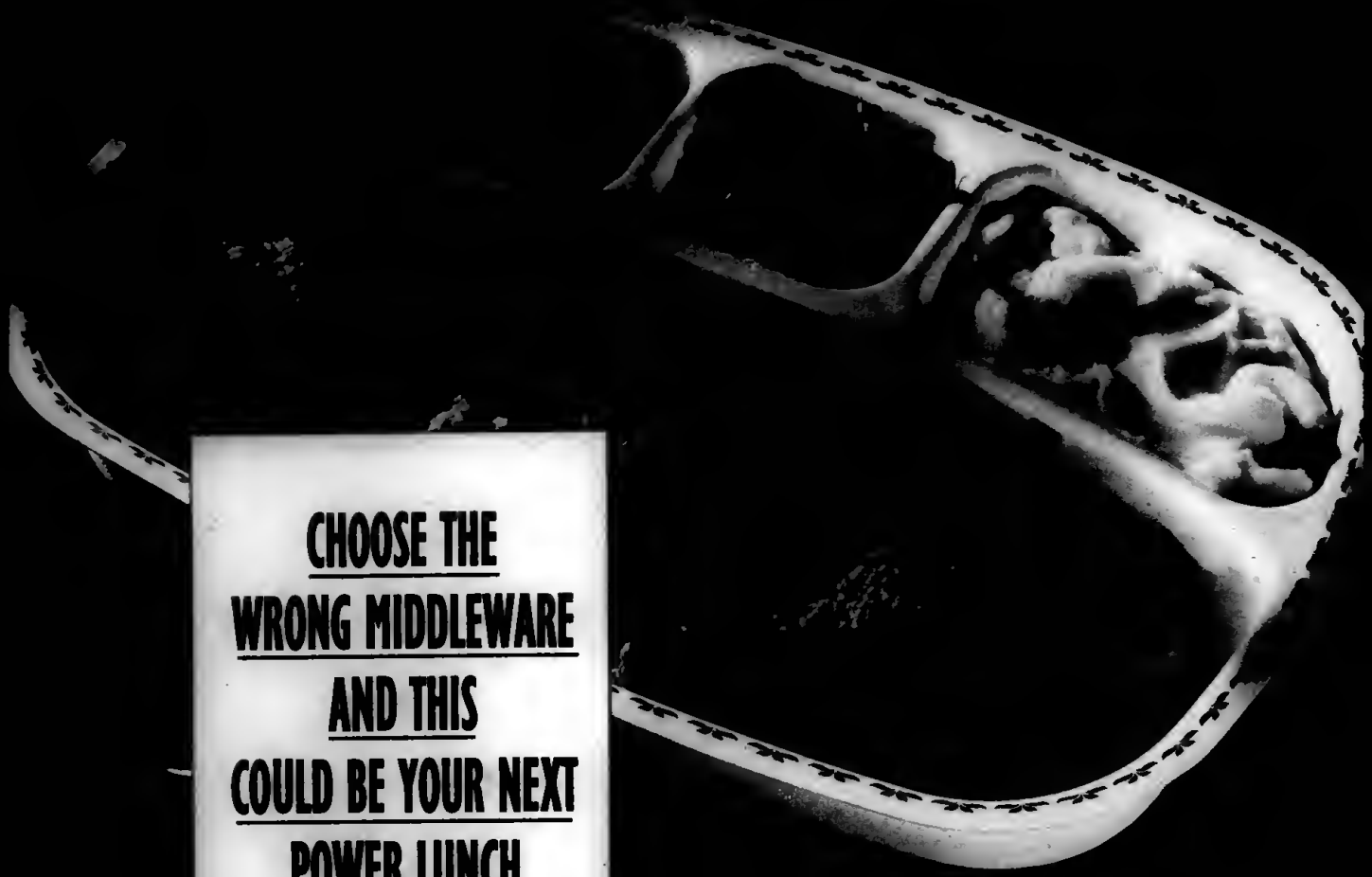
Starting at $995, HP ENTRIA X terminals provide your users with multi-window access to both UNIX® and mainframe applications. With a user-friendly GUI and multiple terminal emulators, this desktop solves your problems today and tomorrow.

And HP's exclusive ENWARE software tools give you complete IS control. With centralized configuration and management. True 'plug and play' functionality. And 'smart power down.'

All this from the #1 X terminal supplier in the world. So call us at **1-800-637-7740, Ext. 8319** to get your free **Desktop Migration Kit** for the HP ENTRIA. It's the smart alternative to dumb terminals.

HEWLETT® PACKARD

UNIX is a registered trademark of UNIX System Laboratories, Inc. in the U.S. and other countries.
©1994 Hewlett-Packard Company PAD9402



CHOOSE THE WRONG MIDDLEWARE AND THIS COULD BE YOUR NEXT POWER LUNCH.

A [illegible]

[illegible] y **EDA/SQL** [illegible] e flexibility [illegible] computing And **EDA/SQL** g [illegible] y any database [illegible]

[illegible] e architecture [illegible] e clean [illegible] ew **Smartmode** [illegible] efore they drive the costs of running applications [illegible]

Bottom line? **EDA/SQL** gives you the freedom to design systems that deliver accurate data to the people who need it no matter what form it's in or where it resides. And with turbocharged price performance ratio. No wonder more than 500 customers already enjoy [illegible] ed success with the client server implementations.

So before you make a decision [illegible] chew [illegible] **EDA/SQL** [illegible] it's your only choice.

For more information [illegible] attend a **FREE** seminar [illegible] to receive a **FREE** White Paper: Migrating to Client Server: A Case for Middleware.

CALL 800-969-INFO

Information Builders

Getting hitched to the Internet

A semiregular column with items of interest and amusement from the Internet.

• Before you can fetch the fun facts and figures available on the Internet, you first need to think about getting yourself connected. CommTouch Software, Inc. in San Mateo, Calif., recently announced a PC-based E-mail client to TCP/IP hosts that eliminates the need for a Unix gateway. Pronto uses Windows' own Sockets (Winsock) API to interface with TCP/IP stacks and uses standard POP and SMTP protocols for exchanging incoming and outgoing mail with the host mail server. The software, which began shipping in July, sells for $69 for a single-user copy. For more information, contact CommTouch at pronto@commtouch.com.

• However, just getting connected may not mean you get your mail. MCI Communications Corp. conceded two weeks ago that an overflow of mail — much of it from the Internet — to users of its MCI Mail service had slowed down the MCI computers supporting this application, backing up mail to the servers trying to deliver it. MCI officials have been quoted as saying they plan to add capacity to their E-mail service with extra computers in the next couple of months.

• If you like learning from history's trend lines, be sure to look at a historical database made available by the Center for Electronic Records on the National Archives Gopher server, GOPHER.NARA.GOV. Among the things you can research are data from the 1970 census, records from the President's Commission on the Space Shuttle Challenger accident and casualty records from the Korean and Vietnam Wars. Send mail to tif@cu.nih.gov.

• For business-related information, check out InterServ, an Internet service provider that recently announced WebMaster, a place for posting product and service announcements. WebMaster is connected to the Internet at t.544M bit/sec., and service starts at $400 per month, plus a start-up fee. For more information, call (206) 447-0800.

• But if the products you seek come from computer or communications vendors, Spry, Inc. in Seattle has NetAccess, a directory of information about 52 of these firms. Organized by topic, such as hardware, software or internetworking services, NetAccess consists of company "home pages," or Internet addresses, for participating vendors. NetAccess comes with Spry's Windows TCP/IP package, the AIR series.

• Finally, the free-wheeling nature of the Internet has software developers and publishers worried — and rightly so — about a mechanism for handling royalty payments. Enter Carnegie Mellon University, which is testing a computerized billing system that would let businesses charge users for documents moved over the Internet for printing or reading.

— Ellis Booker and Gary H. Anthes

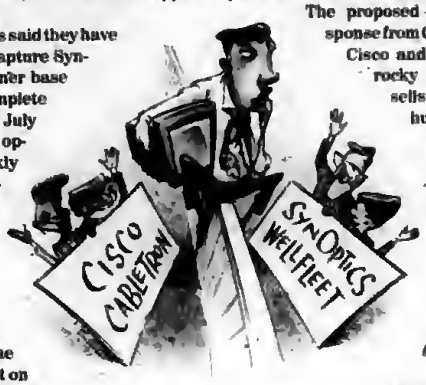
Note: Companies with Internet-related products or services or readers with neat 'net-related info are encouraged to contact us electronically at ellis@cwcom.

Cabletron, Cisco set out to woo competitors' customer base

By Stephen P. Klett Jr.

Competition among the internetworking giants heated up late last month as Cabletron Systems, Inc. and Cisco Systems, Inc. confirmed reports that they would offer SynOptics Communications, Inc. and Wellfleet Communications, Inc. users one year of free service and support to switch to their equipment.

Cisco and Cabletron officials said they have up to a one-year window to capture SynOptics' and Wellfleet's customer base as the two vendors work to complete their proposed merger [CW, July 11]. "We have a tremendous opportunity here, and frankly we're going after it," said Michael Wells, director of marketing at Cabletron in Rochester, N.H.



Free support

Cabletron and Cisco will offer one year of free around-the-clock technical telephone support — and on-site support on a case-by-case basis — to SynOptics and Wellfleet customers who make the switch.

In addition, both vendors said they will continue to offer volume discounts and 30% buybacks on competitors' equipment. This is a common method of warfare most vendors have used on an ad hoc basis to woo one another's customers.

Analysts said that while the tactics may not be new, Cabletron and Cisco's counterstrike is significant because it is coordinated from the top down and both companies are going after accounts together.

"The fact that these two companies are going hunting together is very interesting," said Melinda Lebaron, an analyst at Gartner Group, Inc. in Santa Clara, Calif. Lebaron said she expects other SynOptics/Wellfleet competitors such as 3Com Corp. to follow suit.

The proposed merger and competitive response from Cisco and Cabletron could push Cisco and SynOptics' relationship onto rocky ground. SynOptics currently sells Cisco router modules for its hubs.

"I look at this [merger] like the divorce of two friends. Once they divorce, it's very hard for you to maintain a relationship with either one," said John Morgridge, president and chief executive officer at Cisco in San Jose, Calif., in an interview with *Computerworld* last week.

Moving on

Meanwhile, it is "business as usual" at SynOptics, which expects to maintain its relationship with Cisco because it is "clearly in our mutual self-interest to do so," said Mike Levy, vice president of sales at Santa Clara, Calif.-based SynOptics.

However, he hinted that SynOptics would match the free service and support offering. "If free service and support comes down to us making or not making a sale, we

Cabletron, Cisco, *page 60*

Been there, done that

Computerworld staff writer Steve Klett recently talked with Eric Benhamou, president and chief executive officer at 3Com in Santa Clara, Calif., about the proposed megamerger of SynOptics and Wellfleet and its effect on the industry.

Q: Based on your experiences during 3Com's difficult merger with Bridge Systems in 1987, what do you see as the major challenges facing SynOptics and Wellfleet?

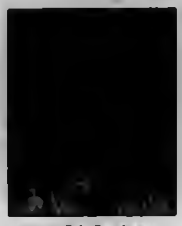
A: In a "merger-of-equals" situation, you have a variety of differences that don't appear when you have a clear acquisition. No. 1 is ambiguity of who the decision-maker is. No. 2 is the need to achieve synergy between your respective administrative and sales forces so you have one interface to the customer. You need to eliminate conflict between internal channels and focus on complementary aspects without stepping on each other's toes.

Q: Do you think SynOptics and Wellfleet can pull it off?

A: I think this merger is the most difficult transaction to complete in the industry. I think SynOptics and Wellfleet can create a strong company, but they will experience some pain.

Q: How will the merger affect your company and the rest of the industry?

A: I think the merger will have a great benefit of clarifying in more dramatic fashion the process of integration.... It is clear we have now fully entered this new phase of the market, and people are looking at their networks as full-connectivity systems, and they need to be masters of hub, switching and routing technology, combined with network management.



3Com's Eric Benhamou *says he thinks the merger will be tough*

Q: What does this consolidation mean for users?

A: Users will engage their suppliers at a different level of debate than they have in the past. They will no longer compare products A and B on price/performance alone. They will look more closely at architectural strategy from three or four main companies, which will really make networking sales similar to the major systems sales we've seen over the last 20 years.

AAA to link up through frame-relay network

By Ellis Booker

The American Automobile Association (AAA) will have 90 of its 127 member clubs linked via a frame-relay network by year's end. This will occur under a $100 million contract announced last week with AT&T Corp.

AAA began deploying its new data network, dubbed ClubLink, late last year, using frame-relay services from both AT&T and MCI Communications Corp.

Coming together

"We said, 'Maybe it's time to consolidate [around one carrier],'" said Bob Galovic, director of telecommunications at the AAA National Office in Heathrow, Fla. He noted that the 92-year-old AAA — which claims 36 million members in the U.S. and Canada — has always been a decentralized operation.

However, the organization has been attempting to centralize and regionalize its operations. "For instance, we're looking at core areas of data and communications standards ... to take advantage of our national strength without losing the local feel," Galovic said.

Fueling the ClubLink initiative has been AAA's move into the wholesale business. Traditionally, AAA members are associated with a local club. Emergency roadside service or travel assistance calls come to that club's local call center.

But since January, AAA has been marketing its services in an unbundled fashion to car manufacturers, credit card companies and cellular carriers, which in turn offer AAA membership as a premium.

These customers call a toll-free phone number, which rings in a consolidated call center at the association's headquarters. Representatives at this center verify membership, gather data and locate the appropriate local AAA club, which receives an electronic alert via ClubLink.

A second application that requires the frame-relay network is a centralized travel information database that is also being developed at AAA's headquarters in Orlando, Fla.

From Novell, Inc. LAN-connected Windows workstations, travel representatives at member clubs will be able to access this host database — based on a Sun Microsystems, Inc. Sun 2000 running Informix Corp.'s Informix — in real time, according to Galovic. The application's primary purpose is to put the information from printed sources into an electronic format so members' travel packages can be better customized.

According to Galovic, as the application scales up to support the approximately 10,000 AAA travel consultants — out of an estimated 30,000 employees total — this host processor may have to be upgraded to a massively parallel processor.

What lies ahead

AAA announced several contracts with AT&T, covering network services and both networking and computer equipment. It will use AT&T 800 Service, Software Defined Network service and Accunet data communications services, as well as AT&T InterSpan Frame Relay Service. Separately, AAA will purchase $20 million worth of PC and server hardware from AT&T Global Information Solutions during the next five years.

Point-to-Point Protocol smooths path to ISDN

By Ellis Booker

A important headway on a uniform Integrated Services Digital Network (ISDN) interconnection standard was made last month as several bridge and router vendors showed their products internetworking with an Internet Protocol.

The Point-to-Point Protocol (PPP) was developed by the Internet Engineering Task Force to interconnect dissimilar LAN connection devices across the Internet.

"The main problem with ISDN networks up until now is that the bridges and routers have used proprietary protocols," said Jeffrey Fritz, a telecommunications engineer at West Virginia University in Morgantown, West Va. He said last month's event was significant because it will eventually free network managers to mix ISDN devices in their wide-area networks. PPP support promises plug-and-play, multivendor ISDN networks, Fritz added.

Nothing new

One ISDN proponent, the University of Michigan Information Technology Division in Ann Arbor, has been offering ISDN access for more than five years using a mix of equipment. "But there are some combinations [of equipment] that work and others that don't," said Dory Leifer, a strategic planner in network systems.

Up until now, cross-vendor connectivity has involved two or more vendors that agree to emulate one another's proprietary protocols. "But I want interoperability to survive, even if this relationship doesn't," she said.

The university has 50 or 60 ISDN users on and off campus but wants to upgrade all its remote users — estimated conservatively at 10,000 — from 9.6K bit/sec. modems to ISDN lines.

Last month's demonstration, presented at the North American ISDN Users' Forum, was sponsored by the National Institute of Standards and Technology in Gaithersburg, Md. Participating vendors included AccessWorks Communications, Inc., Gandalf Technologies, Inc., IBM, NetCS Informationstechnik GmbH and Network Express, Inc.

The multicompany hookup used the PPP protocol running over an ISDN Basic Rate Interface — a 64K bit/sec. B channel. Both bridging and IP-level routing were demonstrated.

Some ISDN equipment vendors said they think PPP support will arrive just in time.

"There's much broader implementation of PPP" because it is a standard and thus more adhered to than proprietary protocols, said Randy Sisto, director of marketing at Network Express in Ann Arbor, Mich. "When you're dependent on emulating a [proprietary] protocol, you might get just one or two vendors to support it," he said.

Shiva opens doors on remote access

By Suruchi Mohan

Vacation may mean sun and sand to some, but to others, it means never having to leave their networks. And for those vacationers, an enhanced remote-access product from Shiva Corp. may fit the bill.

Take Bill Hudson, for example. An assistant computer systems manager at Output Technologies, Inc. in Kansas City, Mo., Hudson recently went on vacation but remained plugged in. He used Shiva's LanRover 3.0 software to log into the network and perform his administration tasks just as if he were sitting in the office.

LanRover 3.0 can connect to a Novell, Inc. NetWare 4.x file server, which a lot of products do not do, Hudson said. By supporting NetWare 4.x as well as earlier NetWare versions, administrators can spread their resources all over the network instead of keeping them all on one file server.

Making it easy

Native Novell IPX support means that when users dial into the network, they become nodes on the network in a way that is transparent to them. Hudson said that although this capability was available before, it was not easy to use.

Nor is IPX the only protocol supported. The product also supports TCP/IP, Apple Computer, Inc.'s AppleTalk, NetBEUI and 802.2/LLC. Whereas the previous versions supported all of these except AppleTalk, they did not do so concurrently, said Keith Burns, systems engineer at Cylix Communications Corp. in Memphis. "With 3.0, we can do both Apple and IBM," he said. "It is important that the IBM and Mac user can share the same system simultaneously."

Stan Adell, computer systems manager at Output Technologies, agreed. "It's worked out real well for a mixed network environment," he said. "We had to use different modems and software for each [system]; now we use just one."

Better connectivity

Adell said his company's remote office in Denver has seen improved performance with Version 3.0. Also, with the earlier version, users would sometimes lose connections, and it was hard to isolate the problem. Since installing the new product, they have not had that problem, he said.

However, Burns would like to see some improvements to Version 3.0 — namely, the activity logger running on an XT or a 286 PC rather than on a 386 running Windows. "All it does is monitor server activity, so why tie up a more powerful machine?" he asked.

A Shiva spokesman responded that most customers have been requesting a Windows interface for their activity logger.

Roving prices

LanRover 3.0 ranges in price from $2,899 to $4,999 from the Burlington, Mass.-based Shiva.

Cabletron, Cisco

CONTINUED FROM PAGE 49

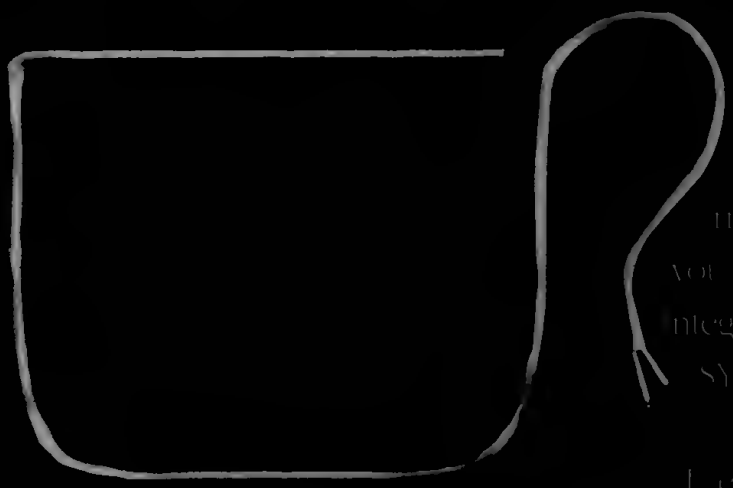
will be competitive," Levy said.

Either way, customers do not appear eager to make a switch.

"A year of free service and support is not that big a deal to us — but maybe if you're a Cabletron site, you would need it," said Mel Lively, network manager at Presbyterian Healthcare System, a large SynOptics and Cisco site in Dallas. Lively said it would not be cost-effective to change brands — either on the hub or router side — because of retraining issues.

"We've already got our networking structure in place, and nothing could justify its disrupture," said Thomas Casey, director of information technology at *Forbes* magazine in New York. *Forbes* uses SynOptics hubs.

Imagine a data network where there's no crosstalk, no lost bits, no signal loss, and the help desk has been turned into the coffee station.

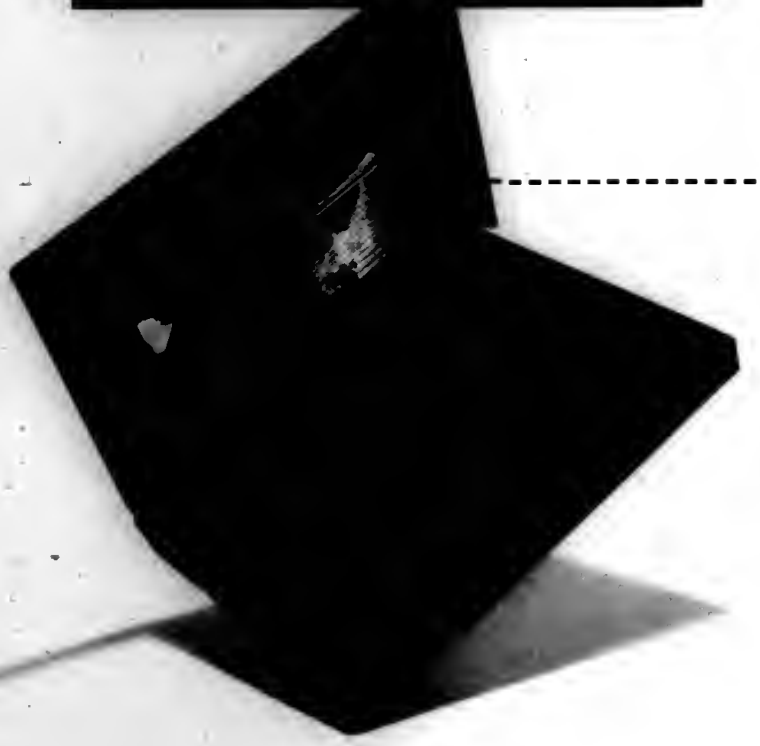


It's 2000 and the year 2000 is right here. Right now. So if you're concerned about data integrity, relax. You need AT&T SYSTIMAX Structured Cabling Systems (SCS). They provide an incredible level of data reliability. And, because the products are designed and manufactured by AT&T, they're compatible and interoperable. The design makes moves and changes fast and easy. What's more, there's enough bandwidth to make the system virtually future proof. All certified AT&T SYSTIMAX SCS installations come with a 15-year extended product warranty and application assurance. And are backed by AT&T Network Systems and Bell Laboratories service and support. And if that isn't reliable, what is? AT&T SYSTIMAX SCS is available only through authorized resellers and distributors. To find out more, call 1 800 344-0223, ext. 4044. Outside the U.S., call 602 233-5855.

AT&T SYSTIMAX SCS. The last cable system you'll ever need.

AT&T
Network Systems

Engineering was showing off again.



ThinkPad® 360, power without the price.

*Hard Disk: Up to 340 MB**

■

Processor: SL Enhanced Intel486™ SX

■

Display: Mono, dual scan, active matrix color or color pen

■

PCMCIA Support: Two type I or type II, or one type III

■

*Battery Life: Up to 10 hours***

■

8 Pre-loaded Business Software Packages: Same as in the ThinkPad 755™

■

*Weight: 5.6 – 6.8 lbs***

■

ThinkPad EasyServ:™† You can have a ThinkPad repaired and returned by courier

■

Warranty: 1-year International Traveler's™‡

■

Prices starting at $1,999§

■

J.D. Power and Associates Ranks IBM Highest in Customer Satisfaction among Portable Computer Business Users¶

**MB stands for Million Bytes. Total user accessible capacity may vary slightly based on operating systems environments. **Depends on usage and/or configuration. †ThinkPad EasyServ is available only in U.S. ‡International Traveler's Warranty and other IBM services are available to those ThinkPad customers traveling to countries where the product is sold by IBM and IBM Business Partners. Other restrictions apply. Please ask your sales representative for details. Information or copies of IBM limited warranties are available through IBM and IBM authorized dealers. §Dealer prices may vary. ¶1993 J.D. Power and Associates Portable Computer Satisfaction Study. Study conducted among business user. ™Only with docking station. ™PC Direct is a registered trademark of Ziff Communications Company and is*

ThinkPad 510, the enormous sub-notebook.

Hard Disk: 200 MB

Processor: IBM BL2-50 (50/25 MHz)

Display: Passive matrix color

PCMCIA Support: One type I or one type II

*Battery Life: Up to 8 hours***

8 Pre-loaded Business Software Packages: Same as in the ThinkPad 755

Weight: 4.0 lbs

Warranty: 1-year International Traveler's™

Prices starting at $2,399‡

ThinkPad 755, the portable outer limits.

Hard Disk: Up to 540 MB

Processor: SL Enhanced IntelDX4™ 75 MHz or DX2 50 MHz

Display: Dual scan or active matrix color

PCMCIA Support: Two type I or type II, or one type III

*Battery Life: Up to 8 hours***

Multi-media: Special effects and stereo sound™

8 Pre-loaded Business Software Packages including: Lotus cc:Mail,™ e-mail for the Advantis Network, OAG FlightDisk™ and SoftNet FaxWorks™ 3.0

Warranty: 3-year International Traveler's™

Prices starting at $3,599‡

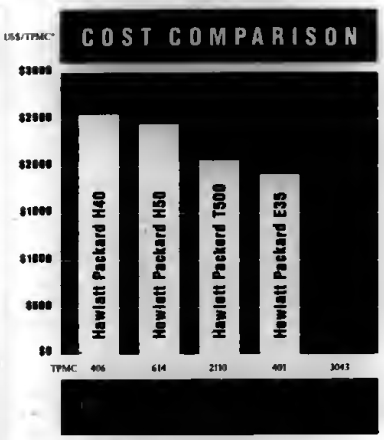
The new ThinkPads.

When ThinkPad was first introduced, the trade press proclaimed it the standard by which all other notebook computers should be judged. This, of course, pleased the folks in engineering. So much so, it appears, they've apparently decided to make a habit of receiving bouquets. Just look at the new line of ThinkPads. More power. More storage. More versatile. And a lot more pre-loaded software. Well, all we can say is, if they're going to top this next year, they certainly have their work cut out for them, don't they? To place an order, see your local authorized dealer, or simply call IBM PC Direct at 1 800 426-7126.™

IBM®

used by IBM, under License. In Canada, call 1 800 465-7999. IBM and ThinkPad are registered trademarks and EasyServ is a trademark of the International Business Machines Corporation. All other products and/or company names are trademarks of their respective holders. Software products listed are licensed to customers under the non-IBM software vendor's terms and conditions provided with the package. IBM makes no representation or warranties regarding non-IBM software. Simulated screen shots. ©1994 IBM Corp.

TANDEM MEANS



"Tandem's Himalaya server pricing is very aggressive, among the leaders in the open system industry. Lingering myths about the costs of Tandem's fault-tolerance are erased by this proof."

–Peter Kastner, Vice President
The Aberdeen Group

■ The independently audited TPC-C benchmark is the best recognized test available for evaluating the performance and cost of servers for real-world, on-line applications.

A MYTH EXPLODED!
AUDITED TESTS SHOW THAT TANDEM HIMALAYA SERVERS DELIVER 50% MORE PERFORMANCE–AT 25% LESS COST–THAN COMPARABLE MODELS FROM HP.

So you can imagine our excitement when the official TPC-C results for Tandem's RISC-based NonStop Himalaya K10000 open servers were compared with several models from HP's 9000 series.

As you can see from the chart, Tandem Himalaya servers deliver better value than any of the HP models tested.

We rest our case. Search the world over, but you won't find better value in an open server. For a free executive summary of the TPC-C benchmark study and a free copy of "Open Computing for Business," call 1-800-959-2492 ext. 717 today.

TANDEM

TANDEM MEANS BUSINESS

TANDEM, HIMALAYA AND THE TANDEM LOGO ARE TRADEMARKS OF TANDEM COMPUTERS INCORPORATED. TPC-C BENCHMARK, TPMC AND TPC-C ARE TRADEMARKS OF THE TRANSACTION PROCESSING COUNCIL. ALL OTHER TRADEMARKS OR REGISTERED TRADEMARKS ARE THE PROPERTY OF THEIR RESPECTIVE COMPANIES.
*OFFICIAL TPC RESULTS—MAY 16, 1994 © 1994 TANDEM COMPUTERS INCORPORATED. ALL RIGHTS RESERVED

Research lab sizes up slew of supercomputers

By Gary H. Anthes
BOULDER, COLO

While users debate the future of different approaches to high-performance computing, one organization is hedging its bets by trying them all.

The National Center for Atmospheric Research (NCAR), sponsored by the National Science Foundation, has shared-memory vector supercomputers from Cray Research, Inc., a massively parallel computer from Thinking Machines Corp., an IBM Scalable Parallel-1 system, a cluster of IBM RS/6000 workstations and a Sun Microsystems, Inc. SPARCserver 670MP.

The National Center for Atmospheric Research *is the only user to have installed the Cray 3*

NCAR is the only user to have installed and tested Cray Computer Corp.'s first offering, the shared-memory Cray 3, which features gallium arsenide processors.

The Cray 3 was brought in a year ago to run climate models, but it was plagued by memory problems, and its performance was too little too late, as even its designer, Seymour Cray, conceded. It had other glitches as well, said Bill Buzbee, director of NCAR's Scientific Computing Division. "The square root is off by 1 bit every 60 million square roots," he explained.

Now the Cray 3 at NCAR sits idle while the research facility uses a greatly improved version of the radical new machine at Cray Computer's facility in Colorado Springs, 100 miles to the south. "It is very nearly a production machine, but it still crashes occasionally," Buzbee said. "Cray has made a lot of progress, and we are pretty demanding users."

Indeed, although the Cray 3 has not been tested on a wide variety of applications, there is some evidence that Cray's long struggle to substitute gallium arsenide for silicon in processors may pay off. An advanced climate model was run on a gaggle of NCAR computers, and the Cray 3 came out tops, running it nearly 25% faster than the top-of-the-line machine from archrival Cray Research.

Place your bids

If Congress is forthcoming with the funds, NCAR will add a new state-of-the-art supercomputer to its $50 million base of scientific computers next year. Buzbee said he expects a bid from Cray Computer for the Cray 4; from Cray Research for the Triton, its next-generation of shared-memory supercomputer; from IBM for the new Scalable Parallel-2; from several makers of massively parallel processors (MPP); and from one or more Japanese companies.

According to Buzbee, a 1,000-processor MPP system costs about the same — $25 million — as a shared-memory vector supercomputer such as the 16-processor C-90 from Cray Research. Both machines can perform at roughly the same level, 5 billion floating-point operations per second (GFLOPS) to 6 GFLOPS.

But Buzbee said he expects the next generation of shared-memory vector machines, such as the 32-processor Triton, to deliver about 20 GFLOPS for the same price.

The purchase or lease cost of an MPP system does not tell the whole story, Buzbee said, because it fails to account for the greater effort required to program it.

To overcome the software disadvantage, a 1,000-node MPP machine would have to work at 40 GFLOPS — four to eight times faster than currently — to make it as attractive as a 20-GFLOPS shared-memory supercomputer of comparable price, Buzbee said.

Meanwhile, NCAR is looking to workstation clusters as a good interactive environment for single-processor supercomputer applications. Costing $2,000 per sustained MFLOPS — less than half the cost of a high-end supercomputer — workstation clusters are "deliciously cost-effective," Buzbee said.

HP tool aids Oracle 7 users

By Kim S. Nash

■ Oracle Corp. has yet to release any object-oriented databases or tools, but Oracle users can get a jump on object programming languages via a database add-on product from Hewlett-Packard Co.

At least, HP hopes that is the case for its so-called Odaptor tool, which was unveiled last month.

A translator of sorts, Odaptor was designed to sit between the strictly relational Oracle 7 database and the C++ and Smalltalk object-oriented languages. The product, which is not due to ship until September, lets Oracle store objects — both data and business models — by mapping them to relational formats.

Though similar tools exist for bridging the object and relational worlds — offerings from Illustra Information Technologies, Inc. and UniSQL, Inc., for example — HP's stability and consulting services stand to attract corporate information systems, observers said.

"The bigger picture isn't one or two capabilities that one product might have over another," noted Hugh Bishop, manager of emerging technologies research at Aberdeen Group in Boston. "The real zinger is being able to deliver a solution [that includes] consulting and integration," Bishop said.

Unlike HP, Illustra in Oakland, Calif., formerly known as Montage Software, Inc. and UniSQL in Austin, Texas, lack extensive internal resources to help IS shops understand and use object-oriented products, he said. Both firms, however, are partnering with integrators and small, third-party consulting firms to provide such training.

In addition, products from Illustra and UniSQL cannot access nonrelational legacy databases.

Many Oracle users are looking for ways to improve application development but have been unable to use C++ or Smalltalk with the Oracle database, said Bruce MacDonald, chairman of the Vancouver Oracle Users Group.

Oracle "is only just now entering the graphical tools market," MacDonald said. "Not everyone's going to wait for Oracle 8," he added, referring to Oracle's hyped but still vague plans for adding object technology to Release 8.0 of its database.

Sybase, Inc. and Informix Software, Inc. users, who also have yet to see object technology addressed directly in their databases, are also in HP's sights.

Odaptor accesses Informix and Sybase databases via Information Builders, Inc.'s EDA/SQL gateways. The links are packaged with the product, which is priced at $6,000 for a license for two concurrent users. Additional users can be added for $3,000 each or $1,500 each in the 128-user range, the HP spokesman said.

What you need

Minimum requirements to run HP's Odaptor object-to-relational translator

	Operating System	Memory	Disk Space*
Client	HP/UX 8.08 or later	32M bytes	10M bytes
	Solaris 1.0 or 2.0	32M bytes	10M bytes
	AIX 3.2.5	32M bytes	10M bytes
	DOS 5.0 or Windows 3.1	4M bytes	1M byte
Server	HP/UX 9.0 or later	64M bytes	15M bytes

[illegible]

[redacted]

Paul Gillin

Keep your eye on CA

Whether you love Computer Associates or hate it (and there are people on both sides of that fence), you have to admit the company is executing very well right now.

In one hyperactive week in May, CA definitively settled its acrimonious legal battle with Electronic Data Systems and purchased The ASK Group for the bargain price of $311 million. The EDS suit had all the makings of a protracted and destructive war, yet CA and EDS lawyers dispatched it with amazing speed. The ASK deal was simply a steal. For less than one year's revenue, CA bought a database with a reputation for technical elegance but marketing mismanagement.

Yet CA's position as the second largest independent software vendor clearly makes the rest of the software industry nervous. The Microsofts, Lotuses and Novells of the world would just as soon it went away.

That's because CA's hardball style and odd business model make the industry jittery. Unlike the PC gang, CA's success did not grow out of a single hit product. The one category CA does dominate — systems management — is about as sexy as moldy cheese. CA executives don't hang at the hot tub with the software zillionaires at industry confabs or one-up one another with the paint jobs on their Porsches. The company doesn't talk much about vision or cul-

Gillin, *page 56*

Users tough sell for AS/400 catalog

By Craig Stedman

As the AS/400 direct-mail catalog turns a year old, IBM hopes it will catch on as a low-cost way of selling upgrades and add-on products to the installed base. But the catalog will not get any birthday presents from several AS/400 users who said they prefer the face-to-face contact of direct sales.

Five customers interviewed recently said they are not using the AS/400 Direct catalog, and four indicated they do not expect to order from it in the future. While discounts of 10% or more are offered through the catalog on products such as memory boards, disk drives and network adapters, they said dealing with an IBM sales representative still holds the promise of better deals.

Direct sales also provides a higher level of comfort with a midrange system such as the AS/400, according to these users. Some said they are concerned they will not get the same level of product knowledge and sales support over the telephone.

"We've looked through it and some of the stuff looks interesting, but quite frankly, it's not the same as talking to a rep and having somebody come out here," said Mare Novik, director of information systems at HealthInfusion, Inc., a Miami-based division of Coram Healthcare Co.

While catalogs are fine for PCs, "it's a little bit different when you're talking about products of this nature," Novik added. AS/400 Direct "could be useful in small accounts or more remote locations where sales reps aren't as readily available," he said.

Aegis Insurance Services, Inc. in Jersey City, N.J., is a small account with a single AS/400 D50 system. But Aegis has managed to keep the ear of IBM's direct sales force at a time when many medium-size and small customers are being handed off to resellers, and it prefers that kind of attention.

"So far, the way history has gone here is that we've used the catalog as a kind of pricing guide for when we're doing budgeting," said John Le Goff, systems development manager at Aegis. "Then we'll talk to our IBM sales rep for ordering. Prices change so fast, and we want to do some wheeling and dealing."

Open to catalog

Ed Taylor, MIS director at Fender Musical Instruments Corp. in Scottsdale, Ariz., has not seen AS/400 Direct but said he would be more amenable to buying products out of the catalog. Other firms selling AS/400 add-ons "don't make house calls either," Taylor noted. "I don't deal face-to-face with that many sales reps anyway."

AS/400 Direct was officially launched as an IBM marketing channel last August, although IBM started testing the catalog in late 1992 and has been counting its revenue since the start of 1993. Analysts estimated that 1993 catalog sales were less than $100 million.

Melanie Dunn, AS/400 catalog manager at IBM, would not disclose the actual sales level but agreed that it was "relatively small" last year. However, IBM expects AS/400 Direct business to quadruple in 1994 and is "very encouraged by the success of the channel thus far," she added.

IBM has increased the number of telephone sales reps dedicated to the AS/400 from five a year ago to about 55, Dunn said. IBM is aware of concerns about the operators' expertise and is "trying to reassure customers that the telesales reps are as knowledgeable" about products as its field force, she said.

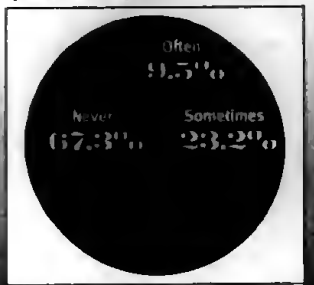
AS/400 Direct is aimed mainly at selling so-called "aftermarket" products to existing customers, from peripheral add-ons to CPU upgrades. "There are certain products that customers really don't need a sales rep to buy," Dunn said. "We also can provide more coverage" at a reduced cost, despite the cutbacks that IBM has made in direct sales in the past few years.

David Andrews, managing partner at the D. H. Andrews Group, Inc., a consultancy in Cheshire, Conn., said he expects the catalog to be a successful mechanism for selling add-ons and perhaps even software to AS/400 shops. "In effect, IBM was smart enough to emulate its competitors," Andrews said. "The prices of these products have dropped so much that they didn't have any other choice."

AS/400 Direct remains a tough sell to some. "The value-add IBM provides is always that they have a good customer relationship," said Roger Finoli, manager of planning and technology at Dominion Textile, Inc. in Montreal. "We are spoiled people, and going through a catalog is not that simple when you're dealing with these things."

Direct dialers

How often have you made technology purchases in response to direct mailings?

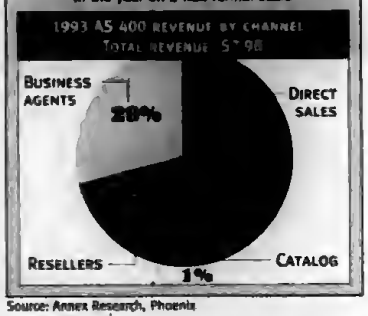


BASE: 1,350 AS/400 USERS

Source: Elms Information Services Group, San Diego

Room to grow

While the AS/400 catalog was an official channel for only five months in 1993, it was used earlier in the year on a less formal basis



Source: Annex Research, Phoenix

Briefs

Levi's data center relocates

Levi Strauss & Co.'s North America division has made it official: It will move its primary data center from San Francisco to Westlake, Texas, near Dallas. Company sources expect the move to take place later this year. Seven months after the firm said it would relocate its data center to avoid potential earthquake damage, it announced that it has subleased 56,000 sq. ft. of space at IBM's Solana data center. About 90 Levi employees will work at the Texas site, but just 16 of them are moving from Levi's San Francisco headquarters, the company said.

HP reassigns manager

Glenn Osaka has moved to where the action is at Hewlett-Packard Co. Osaka, who had been general manager of HP's proprietary HP 3000 division, has taken a new assignment as general manager of HP's Professional Services Organization. He will be in charge of consulting and systems integration.

System backs up Oracle 7

Epoch, Inc. announced that its Epoch Enterprise Backup system can now back up and restore Oracle Corp. Oracle 7 database files. The system is integrated with the Oracle Parallel Backup/Restore utility, allowing multiple data files and table spaces to be backed up at one time.

Gillin

CONTINUED FROM PAGE 55

ture. In the hip, clubby world of software, that's definitely uncool. In fact, belonging to the club doesn't seem to rate very high on CA's list at all.

The right approach

Then there's CA's maddeningly effective business model. In 10 years, the company has increased revenue twentyfold by buying up dying companies, cutting costs sharply through a large onetime layoff and using maintenance revenue to grow into new markets. The approach looks brutal in an industry that prides itself on compassion, but it has brilliantly insulated CA from disaster.

With more than 300 products, none of which accounts for more than 10% of revenue, CA will never have to bet its future on a single hit. It can shrug off product failures or marketing missteps. It will continue to grow because there will always be badly run software companies with good products to buy. And no matter what you may think of CA's business practices, the company understands complex corporate information systems and the issues involved in running them. That's something the PC industry will, for the most part, dutifully ignore.

> CA's position as the second largest independent software vendor clearly makes the rest of the software industry nervous. The Microsoft Lotuses and Novells of the world would just as soon it went away

During the past two years, the company has acknowledged and taken steps to fix some of the customer satisfaction problems that used to make CA-bashing a spectator sport at user gatherings. It has quietly stuck to its CA '90s product integration strategy while other grand schemes, such as IBM's SAA and Digital's NAS, have gone by the boards. It has actually enhanced products such as CA-IDMS and CA-Datacom, which would have been no more than source code escrow bait by now if they had stayed under the control of Cullinet or Applied Digital Research.

Smart move

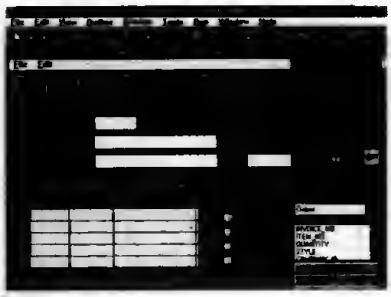
The Ingres acquisition has drawn lots of negative publicity because of the abrupt way CA handled the large accompanying layoff. This company doesn't win many points for being cuddly when it comes to cost-cutting. It usually does one large cutback, reorganizes what's left and moves on. But from a business standpoint, the approach is smart and effective. CA has a knack for acquiring companies just before they go over the brink. The last thing employees or customers need is months of agonizing over who'll stay and who'll go. Users may not like the prospect of CA acquiring one of their vendors, but the alternative — bankruptcy — is worse.

Treating software like a business instead of like some kind of celestial calling has kept CA out of the industry club. But it has also served the company well for almost 15 years and will continue to make it a force to contend with for years to come.

Gillin is *Computerworld*'s editor. His Internet address is pgillin@cw.com.

1 Relax and take a deep breath. SQLWindows® is your quickest way to build and deploy problem-solving applications just like this one. For the quickest start, choose a QuickForm to lay out your application and make all the appropriate connections.

2 QuickForms let you choose data from any database, identify fields and automatically create master detail links. A simple button click generates your QuickForm. By the way, xBASE and Paradox® data drivers are included to help desktop developers move up.



3 Next, customize your QuickForm by choosing QuickObjects from the tools palette. Each QuickObject chosen will be automatically linked to your data sources. In the case just drag and drop a QuickRadioGroup so users can select shirt colors with intuitive radio buttons.

4 What good are color selections in a Hawaiian shirt company if your can't see them? SQLWindows applications can easily incorporate graphical data from any file, OLE server or database with the QuickPicture QuickObject. Just place and size the picture box in your form. See? You still haven't written a lick of code!

When Molokai Outfitters opened their new branch warehouse, QuickObjects from Gupta kept their finger off the panic button. Only available in SQLWindows 5.0, QuickObjects made sure Molokai's critical sales order entry application got delivered in a flash!

Quickly build powerful client/server applications.

Now, client/server applications are in your grasp. New QuickObjects from Gupta make "drag & drop" application development a productive programming alternative to dreary, repetitive coding. In fact, any developer can now build full-featured client/server applications regardless of prior experience. Novices can skip complicated coding and veteran developers can boost productivity before resorting to code for extended functionality.

INTRODUCING SQLWindows 5.0

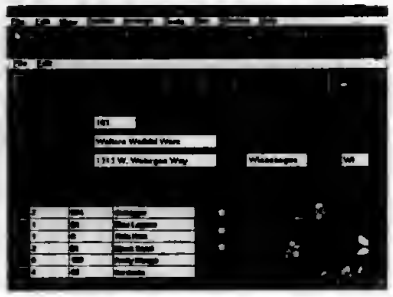
Four ways to a quick start and the power to finish.

SQLWindows Solo™ builds single-user desktop applications. Limited single-user deployment included.

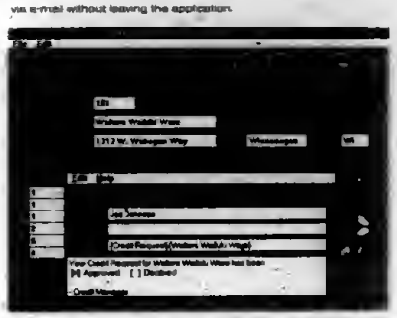
How QuickObjects™ from Gupta kept Molokai from losing its shirt.

5 Painless workgroup integration is just a point-and-click away. Select the QuickEmail object, choose your mail system from the options listed and drop an e-mail data source into your form. Now users anywhere on the network can be notified when an order affects them or requires some action on their part.

6 For instance, each order will require credit approval. This calls for an e-mail QuickObject & pre-defined pushbutton with built-in code to execute e-mail tasks. To run credit checks via e-mail, choose the "Send" e-mail QuickObject and drop a "Send" button on your form's toolbar. Now any user of the application will be able to notify the Credit Department when an order is placed and secure their approval to ship – all via e-mail without leaving the application.



7 Now test your application. Click on the "Run" button in the SQLWindows toolbar. Any errors will be flagged by the internal debugger and a runtime application will be created. Then, for blazing speed, just punch the adjacent SQLWindows Compiler button to tap the performance of the industry's first 4GL compiler.



8 Congratulations. You've just built a powerful client/server mail-enabled application that integrates graphical and SQL data anyone can use. And you did it in less than 15 minutes! Now, Walter's Weekly Wave in Wisconsin will get the 72 dozen Outrigger shirts they need by next week, and you'll be modeling Molokai Outfitters' latest styles on the very beaches that inspired them.

SQLWindows Starter Edition builds fully networked SQL applications and adds Lotus Notes® integration. Deployment licenses are extra.
SQLWindows Network Edition also builds fully networked SQL applications with full network deployment licenses included.
SQLWindows Corporate Edition adds team programming, a fast compiler and a complete set of extended interfaces to CASE products, source control systems and other advanced tools. At list US $99, $995, $1995 and $2995 respectively, no client/server development line packs more choice or value.

FREE
SQLWindows Solo
1-800-876-3267
Regularly $99*

Get started FREE with SQLWindows Solo!

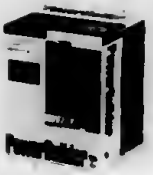
We want network-savvy developers everywhere to get a QuickStart on client/server. So call now for your FREE copy of **SQLWindows Solo**, a $99 value. This limited offer is FREE to the first 10,000 inquirers! See for yourself how quickly you can build powerful client/server applications users love. Make the leap to client/server without losing your shirt. Call **1-800-876-3267** Ext. 307 for your FREE SQLWindows Solo today!

GUPTA™
THE POWER TO GET CLIENT/SERVER DONE

©1994 Gupta Corporation • 1060 Marsh Road, Menlo Park, CA 94025 • 415/321-9500 • FAX 415/321-5471 • Gupta, SQLBase, SQLGateway, SQLRouter, SQLHost, and SQLTalk are registered trademarks of Gupta Corporation.
SQLWindows is a licensed registered trademark and TeamWindows, ReportWindows and EditWindows are licensed trademarks exclusively used by Gupta Corporation. Gupta, QuickObjects, SQLWindows Solo and SQLNetwork are trademarks of Gupta Corporation. Other trademarks are the property of their respective owners.

PowerBuilder (Version 3.0)

PowerBuilder Enterprise (Version 3.0a)



We created the best tool for the job. And the best just got better. We started by making PowerBuilder® "SQL Smart,"™ with an intelligent DataWindow™ object that manages the manipulation of the database directly, eliminating the need to code SQL. The DataWindow lets you access multiple databases while fully exploiting the features of each one, including our built-in Watcom™ SQL database. We made PowerBuilder "Object Easy," with a practical approach to object orientation that eliminates the need to master specialized languages, and increases developer productivity. To support large team development we provided an object library manager, and a central design repository, and we designed PowerBuilder to be open to leverage third-party tools. Everything you need to build enterprise-wide client/server applications is integrated into this intuitive Windows®-based environment. PowerBuilder Enterprise 3.0a gives you PowerBuilder — plus. Plus all our native database interfaces. And to speed development, a suite of productivity tools that includes our Application Library, Developer Toolkit, Watcom Image Editor and the Powersoft Infobase CD-ROM. So you see, it's the same PowerBuilder you've known all along. Only better. Call your corporate reseller or Powersoft at 1-800-395-3525.

Powersoft™

Building on the power of people.

SQL Smart
- Broad native DBMS access
- ODBC support
- Intelligent DataWindow object
- Built-in 32-bit Watcom SQL

Object Easy
- Encapsulation, inheritance and polymorphism
- OLE, DDE and VBX controls

Enterprise Enabled
- Common object library manager
- Centralized data dictionary
- Check-in/check-out
- Graphical application navigator
- Tight integration with 3rd party tools: CASE, version control, automated testing and more

Developer Designed
- Rapid iterative development
- Complete Windows 3.1 support
- Full MDI support
- Configurable toolbars
- 5MB of on-line help
- Integrated debugger
- Robust PowerScript™ language with hundreds of extensible functions

New Features

Native Database Drivers
All native, high-performance database drivers are now included

Application Library
Pre-built objects, windows and functions to speed development

Developer Toolkit
Tools designed to enhance development, performance, documentation and maintenance of applications

Watcom Image Editor
Create and edit Windows resource files such as bitmaps, icons and cursors

Powersoft Infobase CD-ROM
All PowerBuilder documentation, technical product information, tips and techniques with quick search capabilities

Powersoft Corporation, 561 Virginia Road, Concord, MA 01742-2732, Powersoft Europe Ltd., Thames House, 1 Bell Street, Maidenhead, Berkshire, SL6 1BU, United Kingdom. All trademarks and registered trademarks are property of their respective owners.

Vendors spotlight CORBA products

Latest object technologies demonstrated; interoperability among processes highlighted

By Melinda-Carol Ballou

The Object World conference last week in San Francisco showcased technologies that seek to push object-oriented capabilities and the Object Management Group's (OMG) Common Object Request Broker Architecture (CORBA) into commercial prime time.

CORBA is an emerging standard that lets objects communicate with one another across heterogeneous platforms and networks.

Key technologies for commercializing CORBA were demonstrated at the show, including interoperability between CORBA and Microsoft Corp.'s Object Linking and Embedding (OLE), as well as a transaction processing specification for CORBA.

Talent showcase

Approximately 16 vendors showed off their CORBA-compliant technologies. Several others — including Candle Corp., IBM and Hewlett-Packard Co. — took the evolving standard one step further by demonstrating interoperability among different CORBA products.

For example, Candle's Omegamon systems management software running Microsoft's Windows NT made calls to CORBA products from IBM and HP running on AIX and HP/UX platforms, respectively. Candle's object request broker put out calls to the HP and IBM booths and pulled back live data to the Candle booth for viewing on Candle's OmegaView workstation.

Underpinning Candle's Omegamon and OmegaView products is a CORBA-to-OLE interoperability layer, which the company is likely to license, sources said.

Sun-compatible

Omegamon will also run on Sun Microsystems, Inc.'s SunOS, but Sun did not participate in the Object World demonstration. Omegamon will ship by year's end on various Unix implementations and NT. Pricing will be announced at that time.

Candle, IBM and other companies have requested the CORBA 2 interoperability specification from the OMG. CORBA 2, which is expected later this year, will enable various CORBA products to interoperate and is critical to moving the specification forward for viable commercial products.

Also key for the commercialization of CORBA is a transaction processing specification, which was demonstrated at the show by Iona Technologies Ltd. and Groupe Bull running Novell, Inc.'s Tuxedo. The specification is expected to be finalized at the OMG's meeting next month in Dublin. Consensus on the standard has been reached by nine key vendors, including IBM, Transarc Corp. and Novell.

Ole!

At the show, Iona also sought to "out-OLE" Microsoft by demonstrating its version of distributed OLE. Iona set up a Microsoft Excel spreadsheet running on a Windows PC. The PC sent out OLE calls that were translated and mapped to Iona's Orbix CORBA product. Orbix then carried the data across a Unix network of AIX-based RS/6000 workstations. The calls were translated back to OLE and received by a second PC running Excel.

Iona is already shipping Orbix with the ability to distribute OLE across multiple platforms, company officials said.

For its part, Microsoft last month said it will not ship distributed OLE until the middle of next year at the earliest.

Announcements heard 'round the World

Other products announced around the time of Object World include the following:

- **Hewlett-Packard's** new version of Distributed Smalltalk, which company officials said extends the earlier version of ParcPlace Systems, Inc.'s VisualWorks tools to create a distributed development environment.
- **Centerline Software, Inc.** announced ResourceCenter, an environment to help developers quickly and easily catalog, locate and retrieve objects and software components for more effective code reuse. Companies can begin using ResourceCenter immediately with their current code, class libraries and other reusable software assets, officials said.
- **Expersoft Corp.** announced plans to ship support for Microsoft's OLE with the company's XShell distributed object management environment by mid-1995. This will enable developers to distribute and manage objects, including OLE objects, and reusable components in heterogeneous environments, officials said.

Also announced were the following alliances:

- **ParcPlace and Objectivity, Inc.** announced a collaboration in which Objectivity's object database management system will support ParcPlace's VisualWorks client/server development tools.
- **Rational Software Corp. and Trinzic Corp.** will integrate Trinzic's ObjectPro application development tool with Rational's Rational Rose object-oriented technology, tools and services.

—Melinda-Carol Ballou

Interoperability

Microsoft ups efforts to ship 16/32-bit code with Daytona

By Ed Scannell and Stuart J. Johnston

Microsoft Corp. faces a huge job in delivering by the end of September the promised 16- to 32-bit interoperability feature with its upcoming release of Windows NT Version 3.5, one manager acknowledged recently.

"There are lots and lots of 16-bit applications that we need to test," said Dave Seres, senior product manager of Object Linking and Embedding (OLE) marketing at Microsoft's systems marketing group.

Nevertheless, the company still plans to meet the deadline. "The 16- to 32-bit interoperability code is in limited beta, but right now we expect it to be in there" when Daytona ships, said Rich Tong, Microsoft's general manager of corporate and network systems. The company is providing the 16- to 32-bit links through its OLE environment.

That interoperability is crucial to the product's success, particularly with the workstation version, according to users and analysts. To ship it without such support would likely undermine Microsoft's entire desktop strategy, they said.

Users said they would need that feature to make existing 16-bit and future 32-bit applications interact, as well as for a variety of customized functions involving the automation capabilities in OLE 2.0.

Through OLE 2.0 and Visual Basic, "we can gather up different processes like batch files, third-party utilities and shareware things and execute them automatically," said Warren Smith, a certified public accountant and information systems auditor in Pacific Bell's auditing department in San Ramon, Calif.

All things considered

Some users said they would buy Daytona without 16- to 32-bit interoperability but only with rock-solid assurances that it would be delivered within a limited period of time.

"We'd only consider that because there isn't a wealth of 32-bit applications out there. It hasn't become a mission-critical situation yet for us," said Mike Drips, a technical consultant at GTE's Information Services in Tampa, Fla.

The only meaningful 32-bit Windows applications that appear to be on the horizon are from Microsoft. Versions of Word and Excel are currently in beta testing and are not expected until later this summer or early fall, according to Microsoft officials.

While Microsoft has strongly emphasized Windows NT's strengths as a server, Tong acknowledged that the product is selling as a desktop operating system more than as a server — by an 8-1 ratio. However, it is difficult to quantify how many units of the NT desktop version, called Windows NT Workstation, are actually being used as low-end servers, Tong said.

And because so many NT desktop users are power users who will likely demand industrial-strength, 32-bit applications, Daytona's 16- to 32-bit interoperability is even more crucial.

Microsoft is trying to stomp out the remaining bugs in the second beta release of Daytona and stabilize the product as it readies a Release Candidate, or "RC."

Daytona, *page 60*

Tufts implants decision-support system

Red Brick's databases improve data access for the HMO

By Kim S. Nash

Time was, marketeers, underwriters and anyone else who wanted to study medical statistics and patient data at Tufts Associated Health Plan, Inc. had to wait an average of eight weeks — 60 long days — for answers to routine queries of the firm's proprietary Hewlett-Packard Co. minicomputer database.

Even when information systems workers installed homegrown, PC-based decision-support system (DSS) built on FoxPro databases from Microsoft Corp., response time still took 30 days for most users.

The amazing thing is those bad old days were not so long ago. It was not until 1992 that the Waltham, Mass.-based health maintenance organization decided to go whole hog on decision support. Then Tufts brought in new technology — a database that was yet to be built — and hired another manager dedicated solely to making data as reachable as a cup of coffee from the company's cafeteria.

"They didn't call it 'decision support' back then. They just knew that they wanted to access data more efficiently than they had been," said Patricia Donovan, Tufts' manager of decision support.

Lengthy effort

Donovan worked with end users and developers last year to create the FoxPro-based DSS that trimmed reporting time to one month. But even then, Donovan could see that the solution was temporary.

"Thirty days is still inefficient when you're trying to answer questions," she said. "It might even have prevented people from submitting requests because they didn't have time to wait."

Further, at 2G bytes and growing, Tufts' corporate data demanded a more industrial solution.

The FoxPro setup had users downloading either summaries of 2G bytes of data or the raw data itself to individual PCs during each query session. But chunks of information that large cannot be summarized without losing something in the translation, Donovan said. Plus, outfitting every potential user with enough local disk space for that much data would have been costly.

She declined to specify how much money Tufts spent on its FoxPro solution or later efforts. However, money for the project came out of Tufts' central IS budget rather than from each department that received a piece of the DSS, Donovan said.

Let's make a deal

Red Brick and HP announced a deal last week to sell a database/hardware combination specifically geared toward medical-related users such as HMOs and hospitals, looking to do decision support.

Evasive maneuvers

To avoid the wall that IS saw fast-approaching, Tufts turned to Red Brick Systems, a database vendor in Los Gatos, Calif., that specializes in DSS.

Although the IS staff had yet to design or deploy the Red Brick product, that selection was virtually a given by the time Donovan came on, leaving no time to experiment with other database options such as those from Oracle Corp. or Sybase, Inc.

Also, Red Bricks' then-current Release 1.5 of its namesake database lacked several features Donovan deemed imperative, such as multiple ways to ask questions and look at data.

Initially, "I was concerned," Donovan said. But several meetings with Red Brick managers and demonstrations of the product, as well as discussions of planned enhancements for Release 2.0, eased her mind, she said.

Unlike Oracle or Sybase, Donovan noted, Red Brick is completely committed to DSS. Other vendors must also satisfy users doing on-line transaction processing, whose database design often conflicts with that of DSS setups.

Tufts' Patricia Donovan: *Red Brick satisfied the HMO's needs*

Taking a chance

Still, some would call it risky to count on a software product that has not even been built yet. But Donovan maintained that Tufts all but eliminated the danger by negotiating a contract with Red Brick that let Tufts refuse to buy from the vendor if Release 2.0 was not up to snuff.

For example, Tufts wanted Red Brick to expand the number of allowable database rows from about 40,000 in Release 1.5 to more than 340,000. That way, the HMO could designate an individual row for each of its 340,000 members, which is a logical way to separate a database, Donovan said.

In-house developers at Tufts had to manually write a data migration tool to move corporate data from Tufts' existing HP 3000 minicomputer to an HP 9000 Unix box. But IS no longer hand-codes end-user report requests in Cobol or HP's proprietary, fourth-generation language. Instead, end users pluck through menus and icons in Forest and Trees, a graphical, PC-based data access tool from Trinzic Corp. in Palo Alto, Calif. Forest and Trees, in turn, accesses both summary and raw data on Red Brick.

Donovan first deployed the system to two users from Tufts' underwriting and marketing departments because they already had PC experience. And starting small was important because a simpler rollout meant IS could more easily get its arms around trouble, she said.

Now, a total of 28 users from underwriting, marketing and two other units — provider unit managers and research and evaluation — access Red Brick. Twenty to 25 more users are scheduled to be added by year's end.

Daytona

CONTINUED FROM PAGE 59

While Tong declined to discuss sales figures for Windows NT 3.1 to date, he said he regrets his company's prediction last year that it would sell 1 million units in the first year of availability. Most analysts believe it has sold less than half that figure.

"The worst thing we ever did was to talk about numbers for NT," Tong said.

At the same time, however, Microsoft is trying to steer ultrapower users away from Windows and toward Chicago, which is now due early next year.

The client version of Daytona will be for users who need to run high-end applications, such as engineering and financial programs, on machines that have at least 16M bytes of RAM or that need NT's advanced security features.

Users who want to run a mainstream desktop operating system, existing 16-bit Windows applications or the new 32-bit applications will be steered toward Chicago. That operating system will also sport the 16- to 32-bit OLE interoperability code when it ships, said Brad Chase, general manager of Microsoft's Personal Operating Systems group.

Superbica has introduced C++ Coder, a tool for Windows that automatically generates C++ applications that run under Windows or OS/2.

According to the Astoria, N.Y., company, C++ Coder can generate database and calculator programs and C++ class libraries.

Users prepare simple tables describing each record in the application, and the product generates the code, up to 50,000 lines at a time.

C++ Coder comes with a test file generator, an automatic screen design feature and an automatic documentation system that lets users create manuals up to 20 pages long.

C++ Coder costs $500.

▶ *Superbica*
(718) 728-5115

Astea International, Inc. has announced AsteaObjects Library, a tool kit for Powersoft Corp. PowerBuilder developers.

According to the Chalfont, Pa., company, AsteaObjects Library lets developers design applications that have the same look and feel and behave consistently across different development projects.

Developers can integrate the schema definition and attributes of their applications' data windows, define databases with already-created tables, standardize definitions, eliminate duplication, define commonly used elements, generate SQL scripts and customize applications.

Features include an enhanced multilingual data dictionary, dialog and control boxes, selection lists and user and optional objects.

Prices range from $3,000 to $20,000, depending on the number of users and options.

▶ *Astea International*
(215) 822-8888

WorkGroup Solutions, Inc. has announced FoxKit for Flagship, a Microsoft Corp. FoxBase compatibility kit for WorkGroup Solutions' Flagship product.

According to the Aurora, Colo., firm, FoxKit for Flagship lets users move FoxBase applications to Flagship, an Xbase fourth-generation language database development system, and Computer Associates International, Inc.'s Clipper and Xbase compiler for Unix.

The product provides FoxBase programmers with access to more than 50 versions of Unix supported by Flagship to take advantage of multitasking, multiprocessing and speed improvements without any memory limitations.

FoxKit for Flagship costs $150.

▶ *WorkGroup Solutions*
(303) 699-7470

Virtual Prototypes, Inc. has announced Vaps 3.1, a tool set for building and deploying real-time graphical interfaces.

According to the Montreal company, Vaps was designed to automate all phases of the real-time graphical interface development process.

Users develop the interfaces with a set of editors supporting an object-oriented approach. The product automatically translates the graphical prototypes into C code.

The interfaces created with Vaps 3.1 let users interact with the application via graphical representations of real-world objects.

Prices start at $16,500.

▶ *Virtual Prototypes*
(514) 341-3874

FALCONBRIDGE LIMITED RELIES ON A BANYAN SYSTEM TO KEEP ITS 1.4 BILLION DOLLAR INTERNATIONAL MINING ENTERPRISE IN CLOSE COMMUNICATION

"We keep a bird's eye view of all our worldwide operations."

"With en orgenizetlon as diverse end fer-renging as ours, shered informetion is e resource thet's vitel to our operetions."

Merk Pessi's office is in Sudbury, Onterio, but he reeches out to the world – from Cenede to Norwey to the Dominicen Republic end beyond. "Globel communicetion keeps Felconbridge on the mep. Our strength comes from letting our worldwide opereting, exploretion end seles units operete independently, while steying closely linked to eech other."

"Benyen's Enterprise Network Services is the solution thet cen truly support the compeny's decentrellzed business philosophy. From Boneo to Brussels, ecross en environment that includes 20 minis end 2,000 PCs on LANs running VINES®, NetWere®, TCP/IP end AppleTelk®, ell users enjoy e 'single system' network view. They cen instently eccess ell network resources, epplicetions end detebeses. And, thenks to worldwide e-meil, they cen eccess eech other."

If you're fecing the chellenge of globel communicetions, Benyen hes enswers you should know ebout: ENS® for NetWere, HP/UX™, SCO® UNIX®, end VINES. To receive your free Enterprise Networking Kit, cell 1-800-828-2404.

BANYAN®

Call or write for our free Enterprise Networking Kit, including "Delivering E-Mail to the Enterprise," or contact your Banyan Premier Network Integrator.

Name _____

Company _____

Address _____

City _____ State _____ Zip _____

1-800-828-2404

Banyan Systems Inc., 120 Flanders Rd., Westboro, MA 01581

BANYAN

Banyan and the Banyan logo are registered trademarks of Banyan Systems Incorporated. Other trademarks are property of their respective owners.

IS executives are hot to trot out pay-for-performance compensation schemes. But do they really know what they're doing?

Does anyone know how to PAY this game?

BY JULIA KING

A $60,000-a-year information systems manager at Cincinnati-based Community Mutual Insurance Co. could end up earning as much as $67,500 this year. Whether he actually does will depend on how successfully he cuts costs and reduces system errors during production runs.

At Xerox Corp. in Rochester, N.Y., IS managers who meet preset performance goals stand to pocket an extra 10% of their annual salary. If they fail, they could end up losing 5% of their pay.

Welcome to the brave new world of pay-for-performance, where an increasing number of IS organizations are experimenting with paying managers and staffers based on the quality of their work and contributions to their company's business goals, rather than on their seniority or job level.

The idea of getting what you pay for certainly isn't new in IS circles or anywhere else. For years, chief information officers have been under pressure to deliver high returns on investments in hardware and software. Now, they're also being called on to do the same with people, which is one of the main drivers behind many of today's pay-for-performance compensation programs.

The trend toward pay-for-performance "is symptomatic of an overall need for greater cost-effectiveness in IS," says George Florit, president of Michael Delia, Inc., a San Diego information technology management consultancy. "There's a realization that no matter how much magnificent hardware and software is developed, in the end, it's people who make the difference."

IS professionals at all levels seem to agree that pay-for-performance is indeed a good idea. But how to execute that idea is another matter altogether. Conspicuously absent from the scene is any one formula that managers agree on across the board. Several questions remain unanswered.

How, for instance, should performance be defined, and who should measure it and how? Should individual members of the same development team be rewarded differently? How should CIOs measure user satisfaction, which increasingly is being used as a barometer of their own organizations' value? Do performance-based pay programs encourage staffers to produce better systems?

Potential pitfalls are also plentiful. They include inadvertently inciting professional jealousies, rewarding IS staffers based on poorly defined or fuzzy performance criteria and giving workers the message that everything short of total success is of little or no value to the organization.

If pay-for-performance is to work effectively, "there must be very clear criteria for good performance," says Naomi

COMMUNITY MUTUAL'S BILL EAGER *believes in financially rewarding high performance, which is largely determined by peer assessment*

Karten, president of Karten Associates, an information technology management consultancy in Randolph, Mass., and a former IS manager. "But within the [information technology] field, I don't think we have a clue what that is."

Many CIOs are making efforts to find out. They have to. With personnel costs eating up as much as 65% of the average IS budget, IS executives say the pressure is greater than ever to deliver the highest value for every dollar spent on staff.

One way Xerox's IS management is aiming to deliver that value is by giving users what they want, when they want it and at the lowest possible cost, according to Bob Monastero, director of human resources at the company's global information management organization.

Under this scenario, Xerox's top IS managers are required to place 5% of their annual salary at risk in exchange for the opportunity to earn back that salary plus 10%. But in order to get the big bucks, IS must meet certain predefined goals, and the company as a whole must achieve its overall financial goals. The twin targets work to ensure that IS goals are

Pay-for-performance, *page 64*

Get a GRIP

A Colorado Springs utility hopes its new bonus program will keep IS and other personnel on target

Aligning departmental and overall company goals is the primary objective of a new incentive pay program at City Utilities, Colorado Springs' water, gas, electric and waste water services company.

Established Jan. 1, the Group Recognition and Incentive Program (GRIP) establishes both departmental and companywide goals for all employees, including 100 IS staffers and managers.

Among these is resource management systems manager Don Wilaby, who could pocket an extra $750 this year, depending on how well he and his co-workers stack up against newly established IS performance benchmarks and other companywide performance measures. Wilaby is also a member of the committee of staffers and managers who set goals and oversee the program.

> "Today, just having a target is a bigger motivator than the additional pay. In fact, we set the amount of money intentionally low to start with because it isn't necessarily the biggest motivating factor."
>
> —DON WILABY
> Resource management systems manager

IS benchmarks focus on system availability and reliability, customer service and professional training, all of which were chosen during the program's first year "because they're all fairly easy to quantify," Wilaby says. Under training, for instance, IS set a goal of 47 hours for each IS employee during the first nine months the program is in effect.

Companywide, employees are measured in terms of their contributions to the organization's affirmative action and environmental goals, among others. For all employees, half of the bonus is based on departmental goals, and the other half is based on utilitywide goals.

This is not a percentage increase system. Rather, the $750 is a flat dollar amount available to all employees, ranging from $8,000-a-year construction workers to $100,000-a-year utility directors, Wilaby says.

"The whole purpose of the program is to get everyone in line with the management objectives of the company," he explains.

To this end, the same maximum bonus amount is available to each person within the company, but amounts awarded can vary between staffers in different departments. For example, staffers in the IS department and staffers in the customer service department may all meet companywide goals, which is one-half of the total available bonus money, or $375. But if IS staffers do better than customer staffers in meeting departmental goals, IS staffers earn more of the remaining $375.

In many cases, Wilaby says, one department's performance will affect how well another department is able to meet its goals. For example, customer service workers can perform their jobs satisfactorily only if the information systems they need are available to them. GRIP has been architected in such a way to reflect this. From the outset, Wilaby says, GRIP committee members were intentionally vigilant about making sure different departments' goals were comparable and reachable, to avoid political tensions between workers in different areas.

"We won't know until the end of the year, but we feel fairly comfortable that one department will not have it easy to get $750 while another will really have to struggle to get half that amount," he says. "We tried to create a fairly supportive environment."

How well the program works has yet to be determined because it is not yet a year old. But Wilaby is optimistic. "Today, just having a target is a bigger motivator than the [additional] pay," he says. In fact, "we set the amount of money intentionally low to start with because it isn't necessarily the biggest motivating factor.

"Our real focus is getting employees and departments to set targets and measurements and to see how well they do. The money is a reward for doing these things," Wilaby says.

Pay-for-performance

CONTINUED FROM PAGE 63

aligned with overall corporate goals.

For IS, the goals might include reducing costs or meeting strict deadlines on projects that business management has classified as top priority.

In four out of the last six years that the program has been in place for top IS managers, the managers have earned a return on investment exceeding the 5% buy-in price, Monastero says. The other two years, IS managers received less than their 5% ante, primarily due to weak financial performance companywide.

Despite the inconsistent returns, the program has been welcomed by employees, Monastero says. Last year, for example, first-line managers who had not previously been included in the program were brought in at their own request.

These "managers had seen very senior people have this scheme for years and felt excluded," Monastero says.

At the same time, it must also be noted that Xerox does furnish managers with incentives to buy into the program. For example, the company pays managers in their first year in the program the full 10% return on their 5% at-risk investment, regardless of whether the company meets its financial goals.

Using peer assessment

Under a second peer assessment program now being tested within what Monastero describes as a small, "self-empowered workgroup," IS staffers have a direct say in how much their co-workers should receive in annual bonus pay and merit increases.

"Peer assessments are perceptions of group members' contributions by other members of the group," he explains. These perceptions can in turn influence as much as 50% of a worker's pay increase. The other 50% is based on Monastero's assessment. Because the program is in test mode, Monastero has yet to measure its value in terms of improving systems or forging a team-oriented approach to IS projects.

At Douglas Aircraft Co. in Long Beach, Calif., IS staffers' annual bonuses and merit increases also are tied to peer assessments, but the evaluations are conducted outside IS by users.

Survey says

"We do telephone surveys [of users] — one-on-one surveys and paper surveys — and when an IS person delivers a product to a customer, they immediately give them a paper survey," says Pauline Nornholm, general manager of IS. Results of these surveys and additional telephone and one-on-one user surveys are then weighed by Nornholm, along with certain functional performance criteria, such as systems uptime, to determine what level increase a staffer receives.

From time to time, Nornholm says, she also awards discretionary bonuses, which can amount to between 7% and 10% of a staffer's annual salary. These can be given to either an individual or a team for accomplishments such as meeting a tight deadline on a critical project, such as the document management system recently brought up at the firm's headquarters.

Community Mutual CIO Bill Eager also solicits feedback on IS performance via a 40-question survey developed by IS managers. The questions, which among other things "relate to employees' attitudes and supportiveness of team members," are answered by IS staffers and their counterparts in business divisions who work together on project teams. Results influence 75% of IS employees' performance rating and merit increase, which can range between 2% and 7% of their salary.

"Some managers wanted to use 100%, but I think you need to keep some management discretion in the rating," Eager says. This, he explains, is because the "survey process can be a little bit capricious, depending on who surveys are distributed to and how they feel on that particular day."

Such subjectivity aside, user surveys can still be valuable for assessing IS performance and for securing management support for the overall IS function, says DuWayne Peterson, president of DuWayne Peterson Associates, a consulting firm in Pasadena, Calif. He is the former CIO at Merrill Lynch & Co. in New York.

As for assessments by one's IS peers, Peterson says, "their value depends on a company's culture. If you have a cutthroat culture that's very competitive, forget it. [Assessments] could be used just to stab someone in the back. Then again, a lot of times they become very watered down into an 'I'll scratch your back if you scratch mine' situation."

But that's just one of several pitfalls with pay-for-performance programs. Another, observers say, is applying unsuitable performance measurements, such as lines of code written or number of screens produced.

"I think pay-for-performance is a great idea, but our industry is still struggling with the metrics," says Jeff Fisher, vice president of software development at CUC International, Inc.'s Comp-U-Card division in Columbus, Ohio.

The problem with using metrics for software development is that by nature, the work cannot be measured the same objective way that producing widgets in a manufacturing plant can, Fisher says.

"The danger with function points is that they are still an objective rating," he says.

No punishment

Another big difficulty lies with pay structures under which employees receive bonuses only for successful projects, Fisher says. In his opinion, such structures punish for failure.

"And I don't want to punish for failure," Fisher says. "I would rather reward [staffers'] efforts because I want them to try to do their best and to learn from their mistakes." People should be rewarded for learning from their failures as well as their successes, he says.

The bottom line is that for now, many IS organizations are doing just that — learning from their early experiences, both good and bad, with various pay-for-performance techniques, says Robert Zawacki, an IS management consultant at KPMG Peat Marwick in Denver.

"Pay-for-performance is new to everybody," Zawacki says. "The first hurdle is breaking out of traditional thinking about job descriptions and looking at [individuals'] competencies." IS organizations are "no better or worse off than anyone else" in trying to get over that hurdle, he says.

Yet get over it they must, experts say, because as imperfect as pay-for-performance may now be, economics dictate that it is here to stay. ■

King is a *Computerworld* mid-Atlantic senior editor.

Pay-per-performance PLANS

COMPANY	LEVEL	COMPENSATION
Xerox Corp. Rochester, N.Y.	IS management	5% of salary at risk, with potential to earn 10% over salary in bonuses if employee meets preset performance goals and the company meets financial goals.
Community Mutual Insurance Co. Cincinnati	IS management	Results of performance survey influence 75% of employees' merit increase, ranging from 2% to 7% of their salary.
Douglas Aircraft Co. Long Beach, Calif.	All IS staff	Ties annual bonuses and merit increases to peer assessments; also gives discretionary bonuses of 7% to 10% of annual salary.

Calendar

AUG. 14-20

Software Marketing Perspectives '94. San Francisco, Aug. 14-17 — Focus: Strategies and tactics of marketing business-to-business software. Contact: Conference Information Line, (415) 989-8765

Washington Interactive Multimedia '94. Washington, Aug. 17-19 — Contact: Society for Applied Learning Technology, Warrenton, Va. (703) 347-0055

The On-line Networking Exposition and Bulletin Board Service Convention. Atlanta, Aug. 17-21 — Contact: One, Inc., Aurora, Colo. (303) 693-5253.

AUG. 21-27

Partnership Conference '94. New Orleans, Aug. 21-24 — Contact: Computer Associates International, Inc., Islandia, N.Y. (516) 342-5224

Cyberspace and the American Dream. Atlanta, Aug. 23-24 — Contact: The Progress & Freedom Foundation, Washington, D.C. (202) 484-2312.

Data Administration & Information Resource Development. Washington, Aug. 24-26 — Speaker will be Ronald G. Ross, editor of the "Database Newsletter," published by Database Research Group, Inc. Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880

AUG. 28 - SEPT. 3

Client/Server '94 East. Washington, Aug. 29 - Sept. 1 — The conference will focus on users ranging from business executives to technical managers and value-added resellers and integrators. Contact: CMP Publications, Inc., Jericho, N.Y. (516) 733-6700.

Effective Methods of Systems Testing. Orlando, Fla., Sept. 1-2 — Part 2: Process for Test Execution. Contact: Quality Assurance Institute, Orlando, Fla. (407) 363-1111.

SEPT. 4-10

Manufacturing '94. Chicago, Sept. 7-14 — Topics include networking, cost-cutting, quality improvement and technology integration. Contact: Society of Manufacturing Engineers, Dearborn, Mich. (313) 271-1500.

Video Expo/Image World. New York, Sept. 9-14 — Focus: Seminars on emerging technologies, desktop video, computer graphics and animation, corporate media production, multimedia and digital imaging and publishing. Keynotes: "Beyond Reality — New Frontiers in Computing Imaging," by Dr. Alvy Ray Smith, co-founder and president of Altamira Software Corp.; "Non-Linear Editing — Cutting Through the Hype," by Shonan Noronha, editorial director of *AV Video* and *Computer Pictures*; "Freedom, Privacy and Creative Property Rights in the Digital Age," moderated by John Rhodes, communications consultant. Contact: Knowledge Industry Publications, Inc., White Plains, N.Y. (914) 328-9157.

Fill it out. Fax.
Save $8.

FAX NO. 508-626-2705

Yes, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $39.95* per year - a savings of $8.00 off the basic subscription price.

First Name _____ MI _____ Last Name _____

Title _____ Company _____

Address _____ City _____ State _____ Zip _____

Address Shown: ❑ Home ❑ Business ❑ New ❑ Renew Basic Rate $48 per year

* U.S. Only. Canada $95. Mexico, Central/South America $150. Europe $295, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)
- 10. Manufacturer (other than computer)
- 20. Finance/Insurance/Real Estate
- 30. Medical/Law/Education
- 40. Wholesale/Retail/Trade
- 50. Business Service (except DP)
- 60. Government - State/Federal/Local
- 65. Communications Systems/Public Utilities/ Transportation
- 70. Mining/Construction/Petroleum/Refining/Agric.
- 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
- 85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
- 90. Computer/Peripheral Dealer/Dist./ Retailer
- 95. Other _____ (Please Specify)

2. TITLE/FUNCTION (Circle one)

IS/MIS/DP MANAGEMENT
- 19. Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
- 21. Dir./Mgr. MIS Services, Information Center
- 22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr. /PC Mgr. Tech Planning, Admin Svs.
- 23. Dir./Mgr. Sys. Development, Sys. Architecture
- 31. Programming Management, Software Developers
- 41. Engineering, Scientific R&D Tech. Mgt.
- 60. Sys. Integrators/VARs/Consulting Mgt.

CORPORATE MANAGEMENT
- 11. President, Owner/Partner, General Mgr.
- 12. Vice President, Asst. VP
- 13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
- 51. Sales & Mktg. Management
- 70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
- 80. Information Centers/Libraries, Educators, Journalists, Students
- 90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems

(a) Solaris	(e) Mac OS
(b) Netware	(f) Windows NT
(c) OS/2	(g) Windows
(d) Unix	(h) NeXTstep

App. Development Products ❑ Yes ❑ No

Networking Products ❑ Yes ❑ No

COMPUTERWORLD

E4431-0

Recyclable Paper

Fill it out. Fax.
Save $8.

FAX NO. 508-626-2705

Yes, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $39.95* per year - a savings of $8.00 off the basic subscription price.

First Name _____ MI _____ Last Name _____

Title _____ Company _____

Address _____ City _____ State _____ Zip _____

Address Shown: ❑ Home ❑ Business ❑ New ❑ Renew Basic Rate $48 per year

* U.S. Only. Canada $95. Mexico, Central/South America $150. Europe $295, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)
- 10. Manufacturer (other than computer)
- 20. Finance/Insurance/Real Estate
- 30. Medical/Law/Education
- 40. Wholesale/Retail/Trade
- 50. Business Service (except DP)
- 60. Government - State/Federal/Local
- 65. Communications Systems/Public Utilities/ Transportation
- 70. Mining/Construction/Petroleum/Refining/Agric.
- 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
- 85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
- 90. Computer/Peripheral Dealer/Dist./ Retailer
- 95. Other _____ (Please Specify)

2. TITLE/FUNCTION (Circle one)

IS/MIS/DP MANAGEMENT
- 19. Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
- 21. Dir./Mgr. MIS Services, Information Center
- 22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr. /PC Mgr. Tech Planning, Admin Svs.
- 23. Dir./Mgr. Sys. Development, Sys. Architecture
- 31. Programming Management, Software Developers
- 41. Engineering, Scientific R&D Tech. Mgt.
- 60. Sys. Integrators/VARs/Consulting Mgt.

CORPORATE MANAGEMENT
- 11. President, Owner/Partner, General Mgr.
- 12. Vice President, Asst. VP
- 13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
- 51. Sales & Mktg. Management
- 70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
- 80. Information Centers/Libraries, Educators, Journalists, Students
- 90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems

(a) Solaris	(e) Mac OS
(b) Netware	(f) Windows NT
(c) OS/2	(g) Windows
(d) Unix	(h) NeXTstep

App. Development Products ❑ Yes ❑ No

Networking Products ❑ Yes ❑ No

COMPUTERWORLD

E4431-0

Recyclable Paper

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P O BOX 2044
MARION OHIO 43306-2144

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P O BOX 2044
MARION OHIO 43306-2144

Just-in-time Networking

By Joseph Maglitta

Thanks to a massive re-engineering effort by Bell Canada, "call waiting" is an optional service and not a frustrating fact of life for millions of telephone customers in Ontario and Quebec.

Faced with growing long-distance competition since 1992, Canada's largest telecommunications company is reinventing the way it delivers voice, data and video services such as call waiting, caller-ID, Asynchronous Transfer Mode and Integrated Services Digital Network to its two operating companies and, ultimately, to its customers.

Officials at the $3 billion Montreal-based company say the re-engineering anchors a new strategy to make it faster and easier to expand service based on market demand, not long-range forecasts. They say the shift eliminates lengthy waits and will blunt growing threats by Unitel and other powerful new rivals.

"Network provisioning used to take up to 18 months. Now it takes an average of 20 days," says Ray Hing, general manager of business process re-engineering at Bell Sygma Telecom Solutions, Inc. The Toronto-based technical arm of Bell Canada led the project and was spun off as a commercial IS services provider last year.

In the past, Bell's century-old monopoly and notorious bureaucracy made adding unplanned telephone capacity or services a slow, expensive, paper-driven affair. Each order for a telephone switch or peripherals such as multiplexers had to be custom-configured, Hing explains.

Canada's newly open long distance market has attracted the interest of big U.S. telephone companies. Unitel Communications, Inc. is backed by AT&T and another major-force Cellnet, is backed by Sprint. MCI Communications Corp. has a partnership with Bell Canada.

But two years ago, the Canadian government opened long-distance service to competition. Today, a host of powerful Canadian and overseas firms, backed by AT&T Corp. and Sprint Corp., are aggressively vying for the $20 billion market.

Shaping up

With competition looming, in 1988 Bell Canada formed a team to overhaul network delivery, from order entry to on-site equipment setup. The effort eventually involved hundreds of employees at Bell and Northern Telecom Canada Ltd., its equipment supplier.

Re-engineers simplified the back-end process, reducing the number of orderable parts from 4,000 to fewer than 200. Moreover, 289 software-driven features such as Centrex were grouped into 59 modular sets that would be preloaded onto each system. To support the revamped process, key functions such as network planning, budgeting and billing were shifted from an IBM mainframe to an IBM RS/6000-based "Integrated Provisioning System."

The first "Just-in-Time" network delivery was rolled out in 1990. The later phase called 3D—short for Demand Driven Deployment—begins next month.

"The idea is to develop an infrastructure that allows you to be poised for whenever and wherever demand occurs and to activate the process as it is needed," Hing explains.

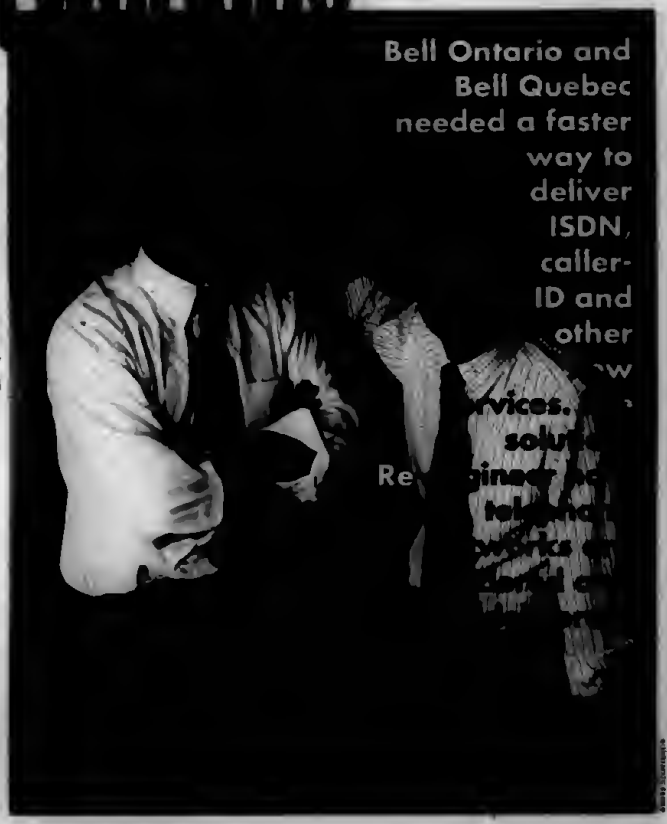
Another innovation: Northern Telecom DMS100 Super Node electronic switches are now shipped to sites with a "universal software load." This contains all basic programs as well as advanced services such as call waiting and caller-ID. A stock of 96Mbyte memory boards are warehoused on-site and installed as needed to handle the extra software-driven functions.

Backers say the "pay-for-what-you-use" approach benefits customers, suppliers and the phone companies themselves. Shipping preconfigured units helps avoid tying up valuable staff resources and capital, says Jean Salinas, general manager at Bell Quebec.

He adds that the new approach let Bell Quebec trim 70 jobs and divert $20 million in capital spending to other projects last year. Similarly, Bell Ontario says it was able to reroute $32 million in capital spending last year and hopes to do so each year.

Other benefits include the following:

- **No more price quotes.** Because switch prices and configurations are now standard, there's no need for complex cost quotations, says Dan Bednis, project manager at Bell Sygma. Gone too are lengthy delays and paperwork associated with ordering extra switch memory.
- **Marketing people freed.** Some technical and marketing employees used to spend 30% to 40% of their time deploying new systems. That has been reduced to zero, Hing says.
- **Productivity boosted.** Thanks to the new, simpler process, one group was able to increase the number of provisioning jobs it handled last year from 300 to 500, according to Hing.



▲ Ray Hing and Dan Bednis, Bell Sygma's re-engineering leaders, build convincing prototypes and deliver incremental functionality every four to six months

Michael Sone, president of NBI, a Toronto-based telecommunications research and consulting company, says speedier service rollout will help Bell Canada keep pace with its new competitors.

But, he adds, "Bell Canada has actually surprised a lot of people with how quickly they have reacted" to the newly open market.

As a result of the initial project, Bell Sygma is marketing the approach, in addition to its re-engineering services, to other Bell operating companies. Hing says his team is shooting to reduce provisioning time to five days. Next project: network delivery of software upgrades.

"We can't afford to wait any more" to speed up service delivery, Salinas says. "The competition will be all over us." ■

Maglitta is *Computerworld*'s senior editor, corporate strategies.

Hints from Hing

As a civil engineer whose work includes stints in Middle East oil fields, Bell Sygma's **Ray Hing** sees parallels between building and re-engineering. "You need a solid foundation," he says. "And you need to understand where the weak links are."

Hing offers other tips from his half-dozen years of heading re-engineering projects:

1. Get rid of the notion that you have to plan everything down to the nth degree. As long as you feel you are heading in the right direction, keep on moving.

2. Shoot for rapid staged implementation, not endless planning and flawless execution. Build convincing prototypes and deliver incremental functionality every four to six months.

3. Don't pontificate. People aren't stupid. You have to do things in a way people feel comfortable with.

4. Let people who run the jobs, not corporate staffers, do the piloting.

5. Work within the system.

COMPUTERWORLD's Code of Ethics

1. Computerworld's first priority is the interest of its readers.
2. Editorial decisions are made free of advertisers' influence.
3. We insist on fair, unbiased presentation in all news and articles.
4. No advertising that simulates editorial content will be published.
5. Plagiarism is grounds for dismissal.
6. Computerworld makes prompt, complete corrections of errors.
7. Journalists do not own or trade in computer industry stocks.
8. No secondary employment in the IS industry is permitted.
9. Our commitment to fairness is our defense against slander.
10. All editorial opinions will be clearly labeled as such.

COMPUTERWORLD

PC software takes next step

Downside to vendor refusals interest in best-of-breed applications

Industry turning to components

Proven hand to guide Novell

Oil pilot strikes savings

Making the strategic choice

IRS turns to imaging to improve performance

WORDS WE LIVE BY.

When you pick up a copy of *Computerworld*, you know you're getting the most objective, unbiased news and information in IS. Our code of ethics guarantees it.

Why do we make such a big deal out of editorial integrity?

Because the words you read in *Computerworld* often have a dramatic impact on your business, your career, and your future.

You use this information to evaluate new products. To get a candid view of emerging technologies. To find out the inside story on corporate strategies. To decide whether to jump ship or stay in your current job. To get the edge on your competition.

In short, *Computerworld* is filled with the words IS professionals like you live by.

WORDS YOU WORK BY.

Week in and week out, our editors and reporters call it the way they see it – on issues ranging from network management to reengineering. They dig deeply to bring you the most accurate, comprehensive news in IS.

It's no wonder over 139,000 IS professionals pay to subscribe to *Computerworld* every week. Shouldn't you? Order today and you'll receive 51 information-packed issues. Plus, you'll get our special bonus publication, *The Premier 100*, an annual profile of the leading companies using IS technology.

Call us toll-free at **1-800-343-6474**. Or use the postage-paid subscription card bound into this issue.

You'll get the kind of straightforward, impartial reporting you can work by. You have our word on it.

COMPUTERWORLD

All that glitters. . .
Multimedia tools have created high expectations, but don't hope for too much too soon. First attempts are often amateurish, and the learning curve substantial. SEE MARKETPLACE

MULTIMEDIA COMES DOWN TO EARTH

But steep start-up costs and system demands trip up a smooth landing

BY ELIZABETH WOOD

The 1994 World Cup Soccer tournament used it to track 1,700 athletes and deliver images of players on badges. The Air Force Academy uses it to teach languages to 1,200 foreign students. Major real estate firms use it to remotely walk clients through properties, and the Federal Aviation Administration uses it to train and test more than 8,000 employees each year. What is it? Multimedia, of course.

The almost-too-good-to-be-true notion of three-dimensional animation, stereo sound, brilliant photographs, graphics, full-motion video and text-and-touch-screen control has finally come down from the clouds, landing firmly — but not necessarily smoothly — in corporate information systems. The bumps include start-up costs and multimedia system demands. Once those are cleared, you can move ahead in the selection of authoring tools (see story below).

Multimedia, *page 70*

AUTHORING TOOLS: YOU TAKE THE HIGH END, AND I'LL TAKE THE LOW END.

Slick multimedia authoring tools that essentially spare users from complex application development are gaining a strong presence in the market. Revenue, which reached $413.1 million last year, is projected to climb to $1.38 billion in 1996, according to a recent Frost & Sullivan, Inc. survey.

But choosing a tool to pull together all of the elements that go into multimedia applications — audio, computer graphics, fonts, video and animation — is not such a daunting task. Your selection depends on your level of expertise and the kinds of

Authoring tools, *page 70*

COMPUTERWORLD BUYERS SATISFACTION SCORECARD

BEST AND WORST

200 users of high-end and midlevel multimedia authoring tools registered their feelings in our Buyers' Scorecard, page 74.

USERS ARE MOST HAPPY WITH:
- APPLICATION QUALITY
- VALUE FOR THE DOLLAR
- ABILITY TO BUILD COMPLEX PROGRAMS

USERS ARE LEAST HAPPY WITH:
- DATABASE ACCESS
- RESPONSIVENESS OF SERVICE
- INTEROPERABILITY WITH OTHER APPLICATIONS

Or, you buy one amazing computer and grow.

Introducing the ValuePoint Performance Series.

The IBM Performance Series approaches computing from a unique position. It assumes your business is going to grow. And that you're going to require more computing power when it happens.

So what you see here is a computer that's so remarkably flexible and upgradeable, you'll actually get to keep it.

It offers SelectaBus, so you can choose between a PCI or VESA local bus. It can run both DOS/Windows and OS/2. It features a 100 MHz IntelDX4 processor. And you can choose from any of our quality IBM monitors. You don't even have to wait or worry, because the Performance Series also comes with a practical price tag, plus a 3-year warranty.*

All of which could make the Performance Series the last computer you'll ever buy.

Of course, it's okay to buy more than one.

For more information, call our 24-hour Personal Systems HelpCenter® at 1-800-772-2227,** or to order call IBM PC Direct® at 1-800-426-7126.

Local Bus, SelectaBus (PCI or VESA)®

Choice of Intel 486 processors up to 100 MHz DX4 – upgradeable to a Pentium® processor

VESA 64-bit local bus graphics

Storage capacity: up to 1.0 GB (4 device local bus IDE)

Warranty: 3-year

Energy Star®

"Plug and Play"®

Operating System: DOS/Windows or OS/2

IBM®

intel inside

*Copies of IBM Limited Warranty are available upon request. **In Canada, call 1-800-465-7999. 4.0 stands for Million Bytes when referring to hard drive capacity. Energy Star emblem does not represent EPA endorsement of any product or service. The Intel Inside logo is a registered trademark and Pentium is a trademark of Intel Corporation. Windows is a trademark of Microsoft Corporation. PC Direct is a trademark of Gift Direct Communications Company, and is used by IBM under license. IBM, OS/2 and HelpCenter are registered trademarks and ValuePoint and SelectaBus are trademarks of the International Business Machines Corporation. © 1994 IBM Corp.

MULTIMEDIA BUZZWORDS

Authoring language
A high-level computer programming facility with English language commands specifically designed to implement multimedia applications.

Compact Disc Interactive
A multimedia standard proposed by Philips Corp. A specification to read data from a CD containing audio, image, graphics and computer data.

Compressed audio
A method of digitally encoding and decoding several seconds of voice-quality audio per single videodisc frame. This increases the storage capability to several hours of audio per videodisc.

Computer edit system
A video editing system controlled by a computer and interfaced to several playback and record machines. This type of system is capable of making precise frame-accurate edits.

Digital audio
A technique that stores audio as a series of numbers.

Digital video interactive
This technology compresses video images and, in its latest version, can produce animated scenes at 30 frames per second. The current compression ratio is 160-to-1.

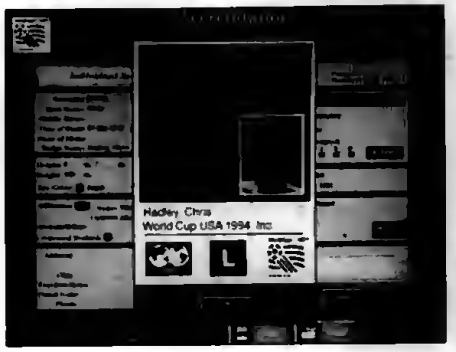
Interactive video
The convergence of video and computer technology. A user has control over a coordinated video program and computer program through the user's actions, choices and decisions, which affect how the program unfolds.

Musical Instrument Digital Interface
Serial data transmission protocol for transporting musical information between compatible electronic musical devices.

Sound board
An add-in card with software that captures and plays back sound or music.

Storyboard
1. A visualization of the order of a piece, using representative frames from each shot or sequence to show a visual skeleton of the piece.
2. Documentation for video production that contains the audio script and a complete description of the visual content often in the form of pictures or sketches.

Video capture card
An add-in card that digitizes analog video from a VCR, video camera or still-image camera. Video can be digitized as a single frame or multiple frames per second to produce full-motion video.



▶ The 1994 World Cup Soccer Tournament tapped the resources of Sybase, Sun Microsystems, Electronic Data Systems Corp. and Sprint Corp. on a global WAN to track 1,700 athletes and manage the logistics and security of the games. GainMomentum, Sybase's authoring tool, included video features that allowed images of participants to be printed on badges and stored in a database. Electronic kiosks delivered game information and statistics, standings and results and player/team profiles to the press and spectators.

Multimedia

CONTINUED FROM PAGE 67

Purchasing a high-powered multimedia system with all the bells and whistles can cost $3,000 to $4,000. This includes CD-ROM players, speakers, high-resolution color graphics monitors, sound boards, video capture cards and a 486-based PC with 16M bytes of RAM and a 350M-byte hard drive. Software such as authoring tools, image editing and graphics-creation programs can add an average of $2,500 to the cost of the development system.

However, the biggest cost of producing any multimedia application is the hidden cost of development time. Costs vary from a low of $10,000 for basic motion and animation to well into six figures for an advanced multimedia application with complex branching. The longer the application runs, the more screen shots, audio and programming required. Interactive branches add to development time by increasing the complexity and logic of the programming

The strain game

The combination of data, sound and video can strain a computer system, especially in a networked environment. Before you start development of a multimedia application, you must have the right hardware in place. To choose the best hardware strategy for your corporation, focus on the following three areas: the delivery system, the development system and the network.

- **The delivery system.** Determine which platform and hardware to deliver on before committing to any multimedia project. Knowing the delivery platform guides the approach to the multimedia application and, combined with how much money you have in your budget, will narrow the choices of application development tools.

In some cases, you will have more control over the delivery system. For example, with a multimedia kiosk, which is a self-contained, free-standing unit used to house an interactive videodisc system, full-motion hardware-assisted video may be used. But a different system may be more appropriate for a marketing demonstration that is going out to thousands of unknown hardware systems and must fit on a floppy disk.

Further, determine whether the multimedia application will need to run cross-platform since this will also limit the authoring choices and file formats.

- **The development system.** Choose state-of-the-art hardware. Don't waste time or money trying to develop on old, slow equipment. Buy the fastest CPU (considering the delivery platform) and at least 16M bytes of RAM.

High-quality audio and video capture cards will record with better results. Look for adapter cards with digital signal processors (DSP). These are programmable devices designed for the specialized computations required to handle video and audio. DSP chips, which are starting to appear on motherboards and upgrade cards, can be reprogrammed as new algorithms are developed. The DSP chip is multitasking, so it can receive a fax and play music at the same time.

If you have to sacrifice hardware expenses, delivering video using a 286 or 386 computer is best done through videodiscs. Video is stored in analog format on the videodisc rather than digitally on the hard drive. Digital video requires a

AUTHORING TOOLS

CONTINUED FROM PAGE 67

features needed in your application. To further assist your selection, these tools use different approaches in order of difficulty: scripted, icon-based, stage-based, timeline and slide-based (see next page for tool definitions).

The following are the market leaders grouped into three categories based on ease of use and capabilities:

HIGH-END AUTHORING

Authorware Professional uses graphical icons in its programming-like scripting approach. *Computerworld*'s Buyers' Scorecard ratings indicate that users were most satisfied with the tool's ability to build complex programs. Users were not as happy with its cost of development and programming language. The product has Windows and Macintosh cross-platform compatibility and costs $4,995.
Macromedia, Inc., San Francisco, (800) 945-4061

GainMomentum is a script-based tool. Its object-oriented authoring allows users to create their own object classes, subclasses and libraries. *Computerworld*'s Firing Line participants were pleased with this product's fluid database access but balked at the steep price ($10,000 for a single-developer's license). In addition to Unix and Microsoft Corp.'s Windows NT, GainMomentum supports Sun Microsystems, Inc.'s SunOS, IBM's AIX, Hewlett-Packard Co.'s HP/UX and other major operating systems.
Sybase, Inc., Emeryville, Calif., (510) 922-3500

IconAuthor is an icon-based tool with scripting. It supports Microsoft's Object Linking and Embedding (OLE), Windows, Macintosh, Unix and OS/2 cross-platform compatibility. It also supports dBase files directly. A Smart Object Editor lets users create fully functional objects such as timers and buttons. The product costs $4,995 and has a $50 runtime fee.
AimTech Corp., Nashua, N.H., (800) 289-2884

Quest is an icon- and script-based tool, depending on which platform you use: DOS or Windows. It costs $3,995.
Allen Communication, Inc., Salt Lake City, (800) 325-7850

TourGuide for Windows is a script-based tool aimed at experienced developers familiar with exotic scripting languages. It runs on a Windows platform and costs $3,370.
American Training International, Inc., Los Angeles, (800) 955-5284

Multimedia Workbench for Supra Server is a script-based authoring tool that includes a multimedia server, Windows client authoring environment, network links and training. The product costs $4,995.
Cincom Systems, Inc., Cincinnati, (800) 543-3010

MIDLEVEL AUTHORING

Director's timeline feature uses start/stop and action syn-

large amount of storage space and creates tremendous I/O demands on the CPU. One frame of uncompressed video is almost 1M byte. There are 30 frames of video per second. That means every second of uncompressed video is 30M bytes.

Digitally stored video is always compressed. How much and at what quality depends on the compression/decompression algorithms (CODEC) used. Joint Photographic Experts Group (JPEG) and Motion Pictures Expert Group (MPEG) are two CODECs emerging as standards.

With JPEG (the standard for still-picture data compression that is now being modified as motion JPEG for video compression) each frame is compressed and transmitted individually, limiting the potential data loss over networks. JPEG has a 40-to-1 compression ratio. Video may be compressed and decompressed using only software. On a standard PC, the size of the video image is limited to about one-fourth of the screen at about 24 frame/sec. This is not full-motion but good enough in many cases.

MPEG, which is a standard for digital video compression, first compresses a still image, then sends only the incremental changes. MPEG can achieve a 200-to-1 compression ratio, but it requires a hardware decoder for playback to achieve full-screen, full-motion video on the delivery system. With pricing at about $495 per MPEG decoder card, it is considerably more expensive than software-only video.

Not every multimedia application needs video. Full-color graphic images and photographs displayed on the screen may deliver the information just as well at lower CPU and network costs.

This points out another concern of the delivery system: the graphics subsystem. The delivery system should display 256 colors at 640- by 480-pixel resolution. Anything less will not deliver useful images.

The delivery system will also need an audio card to enable sound in most cases. Some authoring programs enable sound from the PC speaker chip, but the quality is poor. Audio files are stored in one of two digitized formats: Wave, which is a Windows audio format and Musical Instrument Digital Interface (MIDI). Wave audio files are large, while a MIDI file is one-tenth the size of the same Wave file.

• **Delivering multimedia over a network.** File sizes become critical when delivering multimedia over a network. Many multimedia applications share information interactively, not just as an occasional download from a server database. Few existing Ethernet LANs, Token Ring LANs and wide-area network transport systems are adequate for distributed multimedia even when they include high-speed links and data compression facilities.

A large bandwidth of at least 100M bit/sec. and Asynchronous Transfer Mode and high-speed Fiber Distributed Data Interface is important. Lacking these, many corporations turn to delivering multimedia applications on CD-ROM and videodiscs. This eliminates network bottlenecks but adds hardware costs for individual CD-ROM drives and video adapter cards. ■

Wood is president of Egeland Wood & Zuber, Inc., a corporate communications company in Atlanta that specializes in bringing corporations into the future. Her CompuServe address is 70732,3034.

▶ **CB Commercial Real Estate Group, Inc. uses a low-end multimedia approach by merging its corporate database of properties into off-the-shelf mapping products, MapInfo and MapBasic. This produces an interactive real estate searching tool in which properties are located and identified on a map with overlays of information describing customer demographics and household incomes. A click on each site gives data such as square footage, leasing costs and property taxes. When a property is identified as a possible match, a video walk-through is available instantly.**

chronization capabilities. While users polled in the Buyers' Scorecard were most satisfied with the product's quality of applications developed, they gave its database access low marks. The tool offers Windows and Macintosh cross-platform compatibility and costs $1,195.
Macromedia, Inc., San Francisco, (800) 945-4061

Multimedia Toolbook a script-based approach offers interactive hot words and objects with properties in its application development. Buyers' Scorecard ratings reveal that users were impressed with the product's value for the dollar and cost of distributed runtimes. They were least impressed with the product's system requirements and ease of use. It runs on a Windows platform and costs $395.
Asymetrix Corp., Bellevue, Wash., (800) 448-6543

Animation Works Interactive uses a stage-based approach, which means objects are given a path to follow and assigned a certain number of frames in which the action occurs. It offers Windows and Macintosh cross-platform compatibility and costs $495.
Gold Disk, Inc., Mississauga, Ontario, (800) 465-3375

Q-Media for Windows is a timeline-based tool. It is interactive, easy to use and costs $199.
Q-Media Software Corp., Vancouver, British Columbia, (604) 879-1190

Action is a timeline-based tool that has the ability to import actions created in Macromedia's Director. It runs on a Windows and Macintosh platform and costs $399.
Macromedia, Inc., San Francisco, (800) 945-4061

Entry-level authoring

Storyboard Live uses a stage-based approach and offers audio and video playback without requiring special hardware. It runs on a DOS platform and costs $149.
IBM, Armonk, N.Y., (800) 426-3333

PowerPoint uses a slide-based approach and incorporates audio, video and branching through OLE. It runs on a Windows and Macintosh cross-platform and costs $495.
Microsoft Corp., Redmond, Wash., (800) 426-9400

Compel uses a slide-based approach. It runs on a Windows and Macintosh cross-platform and costs $295.
Asymetrix Corp., Bellevue, Wash., (800) 448-6543

Astound uses a slide-based approach that is object-oriented with timelines for objects and slides. It runs on a Windows and Macintosh cross-platform and costs $129.
Gold Disk, Inc., Mississauga, Ontario, (800) 465-3375

Super Show and Tell is slide-based and has a media objects editor that has five tools on one screen for easy control. It runs on Windows and costs $149.
Ask Me Multimedia Center, Inc., Minneapolis, (612) 531-0503

Tool definitions

Scripted multimedia authoring tools require programming to create an application. The benefit of script-based tools is that they are usually faster and require less overhead to run. You also have precise control of all actions taking place in the multimedia application.

Icon-based tools create multimedia applications by connecting groups of graphical icons together that represent actions the computer will take. The icons have been programmed to perform specific tasks, or you can create more icons and program them for your application.

A stage-based multimedia authoring tool starts with a blank screen with objects. Each object is given a path to follow and assigned a certain number of frames in which the action occurs.

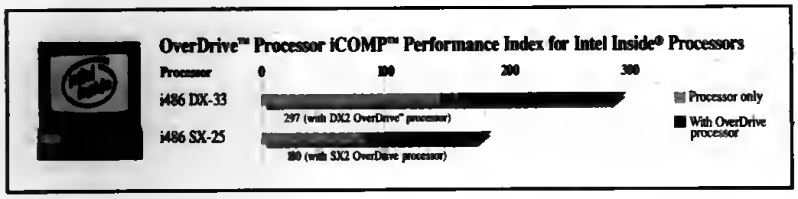
A timeline-based program also starts with a blank screen and adds objects onto the screen. The action of each object is controlled by a timeline with precise start/stop and action synchronization capabilities.

Slide-based authoring programs do not require programming to create an application. Changes take place as each slide appears and transitions into the next slide.

CPU upgrade.
OverDrive™ processor, a family of single-chip upgrades that significantly boosts the overall performance of your Intel486™ SX and DX processor-based PCs.

Slow performance.
Your software is bogged down, but you can't buy a new PC right now.

To speed up your 486,



Free OverDrive™ processor demo disk.

To see how much faster your software runs with an OverDrive™ processor, call 1-800-538-3373, Ext. 178 for your free demo diskette. Or simply complete this card and drop it in the mail. Either way, it's the right path to take.

Please answer the following questions to help us better serve you. Thank you.

1. What Intel processor-based system(s) are you currently using?
   i486™SX____ i486™DX____ IntelSX2™/IntelDX2™____
   IntelDX4™____ Pentium™____

2. How many OverDrive processors are you or your company interested in purchasing?
   0____ 1-9____ 10-49____ 50+____

3. When are you interested in purchasing an OverDrive processor(s)?
   0-60 days____ 61-120 days____ 120+ days____

Name_____

Title_____

Company_____

Address_____

City_____State____Zip_____

Daytime Telephone #_____

For inquiries outside the U.S., affix proper postage. European residents may also call +44 (0) 793 431155, and ask for infopack IOD15

ODBRC8 ©1994 Intel Corporation.

intel.

ECD4032CWD

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
First Class Mail Permit No 79 Portland, OR

Postage will be paid by addressee

intel®

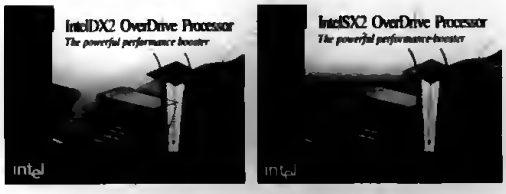
PO Box 10266
Portland OR 97210-9879

Call 1-800-538-3373, ext. 178.†
To find out more about the IntelSX2™ and IntelDX2 OverDrive processors and to receive a free demo disk.

Speeds up software.
Microsoft Excel* 4.0 runs 83% faster and Microsoft Word* 2.0 65% faster when you upgrade a i486™ SX-33 processor with an IntelDX2™ 66 MHz OverDrive processor.

†For European residents, call +44 (0) 793 431155, and ask for Infopack IOD15.
© 1994 Intel Corporation. *Other brands and names are the property of their respective owners.

follow the upgrade path.



OverDrive™ processor family of products

intel®

Buyers' Scorecard: Authoring tools high in quality and complexity

COMPUTERWORLD BUYERS SATISFACTION SCORECARD

Satisfaction rankings

High-end authoring tools

1. AIMTECH'S ICONAUTHOR FOR WINDOWS
2. MACROMEDIA'S AUTHORWARE PROFESSIONAL FOR WINDOWS

Midlevel authoring tools

1. MACROMEDIA'S DIRECTOR
2. ASYMETRIX'S MULTIMEDIA TOOLBOOK

USERS RATED PRODUCTS IN 17 CATEGORIES. OVERALL RANKINGS ARE BASED ON THE AVERAGE RATING WEIGHTED IN IMPORTANCE OF EACH CATEGORY

Market-leading authoring tools

RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST

RESPONSE BASE: 50 OR MORE USERS PER PRODUCT

Ratings categories	High end		Midlevel	
APPLICATIONS	7.8	8.1	8.1	7.3
EASE OF USE	7.0	7.1	7.2	6.9
SUPPORT	8.0	6.2	7.3	7.3
COST	7.2	7.1	7.4	7.4
COMPATIBILITY	6.9	6.9	7.1	6.8
PROGRAMMING	7.3	7.4	7.3	7.2
FUNCTIONALITY	7.0	7.0	7.3	6.9
SYSTEM REQUIREMENTS	7.2	7.2	7.3	6.7

By Michael Sullivan-Trainor

More than 200 users of multimedia authoring tools from high-end and midlevel vendors said they were most satisfied with the quality of applications they were able to build. That's saying a lot given the complexity and learning curve required to produce and integrate graphics, text, video and interactive features in a single application.

Macromedia, Inc., a market leader in multiple tool categories, received the highest ratings (8.1 on a 10-point scale) for application quality for both Director and Authorware.

High-end rival, AimTech Corp.'s IconAuthor, scored just below Authorware Professional in application quality. Although IconAuthor users were less satisfied than Authorware users in seven of the 16 categories, the product received higher ratings in technical support, value for the dollar and system requirements.

Bang for the buck

In the more price-sensitive midlevel area, Asymetrix Corp.'s Multimedia Toolbook received its highest satisfaction rating in value for the dollar. Value was the second most important category to users of both levels. Macromedia's Director received comparable ratings in value and ease of use.

Overall, users were less satisfied with their products' ability to provide database access and interoperability. All received a 6 on a 10-point scale for these categories.

All of the users, who were running a variety of versions of the products, overwhelmingly said they would buy the product again. Director was the high scorer garnering continued allegiance from 90% of the 52 users surveyed.

Users were primarily using the products to build computer-based training, internal presentation, kiosk or informational applications.

The survey was conducted in June and July by the *Computerworld* Database Division in Framingham, Mass., and First Market Research in Austin, Texas. Approximately 2,000 users of multimedia products were contacted. Users were identified for Apple Computer, Inc.'s Media Kit and Allen Communication, Inc.'s Quest in addition to the four products profiled. Insufficient responses were collected for a reportable sample of the Media Kit and Quest results.

A minimum of 50 users per product was required. The survey was based on 16 question areas determined in consultation with experts and research firms knowledgeable about authoring tools.

For a methodology or further information, contact Michael Sullivan-Trainor, senior editor, CW Guide, *Computerworld*, (800) 343-6474, ext. 229 or on the Internet at mstrainor@cw.com.

The vendors profiled can be reached as follows: AimTech Corp., Nashua, N.H., (800) 289-2884; Asymetrix Corp., Bellevue, Wash., (800) 448-6543; and Macromedia, Inc., San Francisco, (800) 945-4061. ■

Sullivan-Trainor is *Computerworld*'s senior editor, CW Guide.

What's important in a multimedia authoring tool?

RANKING IS IN ORDER OF IMPORTANCE TO 200 USERS SURVEYED

1	APPLICATIONS	•Quality of applications developed
2	EASE OF USE	•Ease of use •Documentation
3	SUPPORT	•Responsiveness of vendor's service •Quality of technical support
4	COST	•Value for the dollar •Cost of distributed runtimes •Cost of development kit
5	COMPATIBILITY	•File format support •Interoperability with other applications
6	PROGRAMMING	•Ability to build complex interactive programs •Programmability
7	FUNCTIONALITY	•Handling video elements •Handling audio elements •Database access
8	SYSTEM REQUIREMENTS	•Drivers/support for peripherals •Development system requirements

GAINMOMENTUM: Powerful interactivity, slow video/data access

GainMomentum

Computerworld's Firing Line is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in live application environments.

■ Sybase, Inc.'s GainMomentum 3.0 high-end multimedia authoring tool provides powerful features for quickly creating interactive applications.

■ But users said GainMomentum's ability to quickly incorporate video is lacking. They also found the $10,000 price a bit steep.

Sybase shipped Versioo 3.0 of its GainMomeotum multimedia authoring tool in June. Based on a product acquired through its merger with Gain Technology last year, GainMomentum 3.0 features an improved user interface, new sequencing and object browser tools and support for Microsoft Corp.'s Windows NT. In additioo, GainMomentum supports Sun Microsystems, Inc.'s SunOS, IBM's AIX and Hewlett-Packard Co.'s HP/UX.

QUALITY OF APPLICATIONS

Overall, the evaluators were satisfied with the speed and quality of the applicatioos produced.

Laboratory: "In spite of the performance hit we take because sometimes we're having to go out and qoery the database or the server more times than we should have to, I was really pleased to see the power of the applications we were able to put together within six weeks."

VALUE/COST

Initially marketed with a $20,000 price tag, GainMomentum is oow more affordable at $10,000, but the evaluators said that is still a large investmeot for a development tool.

BUILDING COMPLEX PROGRAMS

The evaluators praised GainMomeotum's ability to make complicated interactive functions very easy to accomplish.

Telecommunicatioos: "Before we had [GainMomentum] in-house, we had specified a certain level of interactivity. Once we got it in and really saw the flexibility of it, we were able to increase the interactivity of the applications."

HANDLING OF VIDEO AND AUDIO

The product's audio capabilities barely met expectations, particularly in the Windows NT implemeotation. The video worked well when loaded, but preparing it for the GainMomentum environmeot took too long.

Laboratory: "The audio sort of works as expected. I've done a limited amount with the video, but I've found it very difficult. Bringiog videos that are anything more than a few small frames into the envirooment is very painful."

INTEROPERABILITY

GainMomentum provides interoperability, but on a limited scale, the evaluators concluded. The more complex the information in other environments, the more difficult it is to use.

Governmeot: "The ability of the developmeot environment to access the outside world, either through the direct library calls, through sockets or using a system call to pass a Window ID off to another program, is very powerful. But again, it's hard to pass some of the data around, back and forth, because you can't pass structures of information. You have to pass individual parameters."

PROGRAMMING LANGUAGE

The evaluators said the new features of the Gain Extension Language (GEL), such as user-defined classes, greatly increase the capability of the programming language. But thereare occasioos when C libraries have to be accessed.

Governmeot: "It met our expectations. But we often find ourselves going outside GEL to C and linking it to C libraries to do a lot of the heavy calculating and algorithmic work that we need."

Laboratory: "in our application, we make tremendous use of dynamic linking, and it's oot something that we can create within GEL because we're osing the [Object Management Group's] Common Object Request Broker Architecture."

DATABASE ACCESS

While the evaluators liked improvemeots to data access, which made better use of Sybase features, they said that support for Oracle Corp.'s database has become a lower priority since Sybase acquired Gain Technology.

Telecommonications: "Essentially, database access is lower than our expectation because originally in our design we were planning oo accessing Oracle. There were supposed to be Oracle hooks in GainMomeotum. However, when Sybase came in, they really focused on the Sybase books, and Oracle was put oo the back burner."

By Senior Editor Michael Sullivan-Trainor

Sybase's GainMomentum

Sybase, Inc., Emeryville, Calif. (510) 922-3500

RATINGS ARE BASED ON USER EXPECTATIONS ON A 1-TO-5 SCALE, WHERE 1 IS BELOW EXPECTATIONS AND 5 IS ABOVE EXPECTATIONS. RATINGS ARE PRESENTED IN ORDER OF IMPORTANCE TO USERS.

4	OVERALL RATING
3	QUALITY OF APPLICATIONS
3	VALUE FOR THE DOLLAR
4	SUPPORT/DOCUMENTATION
4	SERVICE
4	BUILDING COMPLEX PROGRAMS
3	COST
3	HANDLING OF VIDEO/AUDIO
3	INTEROPERABILITY
3	PERIPHERALS/DRIVERS
4	PROGRAMMING LANGUAGE
4	DATABASE ACCESS

Sybase responds

Sybase responded to the issues raised in this evaluation:

Video performance
The original strategy with respect to video performance was to provide a software-based solution. As video boards have become more prevalent, we are now moving to support those directly. By supporting video boards we are able to increase video performance dramatically.

Oracle support
Since Sybase's acquisition of GainMomentum, the company has continued its commitment to support other database environments. GainMomentum 3.0 currently supports Oracle Version 6 and will support Oracle by year's end.

Cost
Sybase is committed to providing GainMomentum at a competitive price.

Available only in Computerworld!

"Oops - I forgot to log off again."
One-size fits all 50/50 blend Cotton/ Polyester. Made in U.S.A.

"Don't panic! Just push the escape key."
Ceramic 10 oz Mug

"What's the digital bathroom scale doing in my laptop case?"
32. oz. Sip-it Bottle with insulator.

"What's the digital bathroom scale doing in my laptop case?"
Roomy 100% natural cotton canvas with webbed straps, 14" x 9".

"Bud and Elliot Grundt develop the first Mainframe Mouse."
Mousepad, 8 1/2" x 7 3/4".

"Don't panic! Just push the escape key."
Durable and roomy, 16" x 9" black cotton canvas - includes sturdy webbed straps & zipper. Made in U.S.A.

Give the gift of laughter.

What's so funny about technology?

Plenty — especially if you follow the cartoons of Rich Tennant in *Computerworld*.

The fact is, Tennant's whimsical "5th Wave" series has brought smiles to the faces of hard-working *Computerworld* readers since it first appeared in 1990.

Now we've taken some of his all-time funniest cartoons and turned them into a line of custom products that are guaranteed to delight and amuse.

Having trouble finding the right gift for a business associate who's just been promoted? Looking for an affordable birthday present for a co-worker? Need creative boliday gifts for client's in the IS industry?

Computerworld products are just the ticket.

You don't need a special occasion to give a *Computerworld* gift. But you do need to order right away, since supplies are limited.

Just fill out the attached form or call us at 1-800-222-7545 or fax your order to (508) 626-8258. And give the gift of laughter.

ORDER FORM

To order a Computerworld gift, fill out this form and fax or mail it to:

COMPUTERWORLD
P.O.Box 9171
Framingham, MA 01701 U.S.A.
Attn: Product Fulfillment

Can't wait?
Call 1-800-222-7545 or Fax (508) 626-8258
(Monday-Friday 8:30-5:30 EST)

SHIP TO:

Name

Company

Address (Please use street address, UPS does not deliver to P.O Box)

City State/Province Zip/Postal Code

Country

( )
Daytime Phone

To order: Fax 508-626-8258 or Call 1-800-222-7545.

Item		Price	Quantity	Amount
C1AD3	Mug	$7.99		
C2AD3	Sip-it	$7.99		
C3AD3	Mousepad	$4.99		
C4AD3	T-shirt	$15.99		
C5AD3	Sweatshirt	$24.99		
C6AD3	Duffle	$16.99		
C7AD3	Tote Bag	$12.99		

Shipping & Handling

AVOID DELAY! Please include Shipping & Handling. If your merchandise subtotal is:

UP TO	$10 00	$2 50
$10.01 -	$20 00	$3 95
$20 01 -	$35 00	$4 95
$35 01 -	$50 00	$6 95
$50 01 -	$100 00	$9 95
OVER	$100 00	$13.95

* For Canada and International orders, please add $5.00 per item for Shipping and Handling.

Subtotal	
Shipping & Handling*	
Sales Tax**	
Total	

** Residents of MA, CA, NJ, GA and DC, add applicable sales tax. Canada residents add G.S.T.

Method of Payment (in U S dollars only)

Check or Money order payable to: **COMPUTERWORLD**

❑ VISA ❑ MC ❑ AMEX

Card No.

Exp. Date

Signature

Your credit card will not be charged until your items are shipped.

Thank you for your order!

COMPUTERWORLD
The Newspaper of IS

If I Fail, YOU Fail

The word "teamwork" doesn't mean much to business managers. It's about time they stop pointing the finger at IS and share in accountability for technology projects.

SOME YEARS BACK, I worked for the aerospace division of a large Fortune 100 company. The parent company prided itself on accomplishing tasks quickly and with a high degree of teamwork. Unfortunately, neither of these attributes were associated with the information technology department.

According to the description by one of the non-information systems managers who also worked there at the time, systems were never within budget, never on schedule and never delivered what was promised.

In my mind, these failings were due to a lack of true teamwork. No, not within the IS department; what was lacking was teamwork between the IS department and the operating departments it served.

The problem stemmed from the fact that upper management never truly defined what teamwork actually meant. The implication was that teamwork was everyone working together toward the same goal. But in actuality, not everyone on the team accepted equal responsibility and accountability for the results of their efforts. Unfortunately, only the IS group was held accountable for delivery of the system.

It seems to me that there's something basically wrong with this premise. Let's say, for example, that you have a crew of people composed equally of IS and operating department personnel on a sailing ship. They're caught in a storm near a rocky coast, and the wind and seas are about to force them onto the rocks.

Now in this case, it's important that everyone work together as a team. Failure to do so would result in disaster.

Teamwork, *page 78*

BY LARRY RUNGE

Teamwork

CONTINUED FROM PAGE 77

It wouldn't matter if you worked in the rigging in the howling wind or just stood aside and gave orders. If the ship hits the rocks, you're all going down together. This is true teamwork at its finest.

However, I can assure you that the non-IS half of the team would not be as committed to saving the ship if it knew a helicopter was going to pluck it from the deck before the ship sank, leaving only the IS folks to their briny fate.

I have seen several systems managers lose their jobs because of project failures, but I have seen only one non-IS manager lose his job for the same reason.

What's wrong with this picture?

Let's face it, systems development requires teamwork between IS and the operating departments it serves. It's not enough to set budgets and schedules and then hold IS responsible for them.

Here's another incident from a few years ago in which I had firsthand experience. I've also seen this situation happen at various companies over the years.

This particular company approved a project intended to reduce head count in one of its departments by 30%. The plan was to go from a batch processing system, which required manual data entry, report printing and keypunching, to a system that was completely on-line. The firm also hoped to reduce cycle time.

While there were some travails, IS delivered the system. The system did reduce cycle time and increased efficiency.

Yet the operating manager who was charged with reducing head count claimed he couldn't do so. He blamed the system, saying it failed to deliver promised functionality.

While the system did not supply every bell and whistle, the truth was the manager was afraid business was going to increase, and he would need all of his people. He wanted to keep his staff instead of reducing it and then having to hire more people later. He thought this made him look good.

If the ship hits the rocks, you're all going down together.

IS was held completely responsible for the perceived debacle, and the group lost much credibility among the business managers. Another project under way came under intense scrutiny, as did budgets and schedules for future projects.

No one ever held the operating manager accountable for failure to cut the head count, even though it was a goal that was agreed on as a team.

Senseless system

If this appears to be a Faustian bargain, that's because it is. From a business standpoint, not only does this approach not make sense, but it is also unprofitable and even borders on stupidity. This is certainly not teamwork; in fact, you could even call it antiteamwork.

I propose a change. When agreeing on the budget, schedule and technical deliveries for a project, the IS manager and his non-IS counterpart must agree on the efficiencies the operating department will gain. That is, if the goal of the project is to reduce operating costs by 20%, then both managers must be accountable.

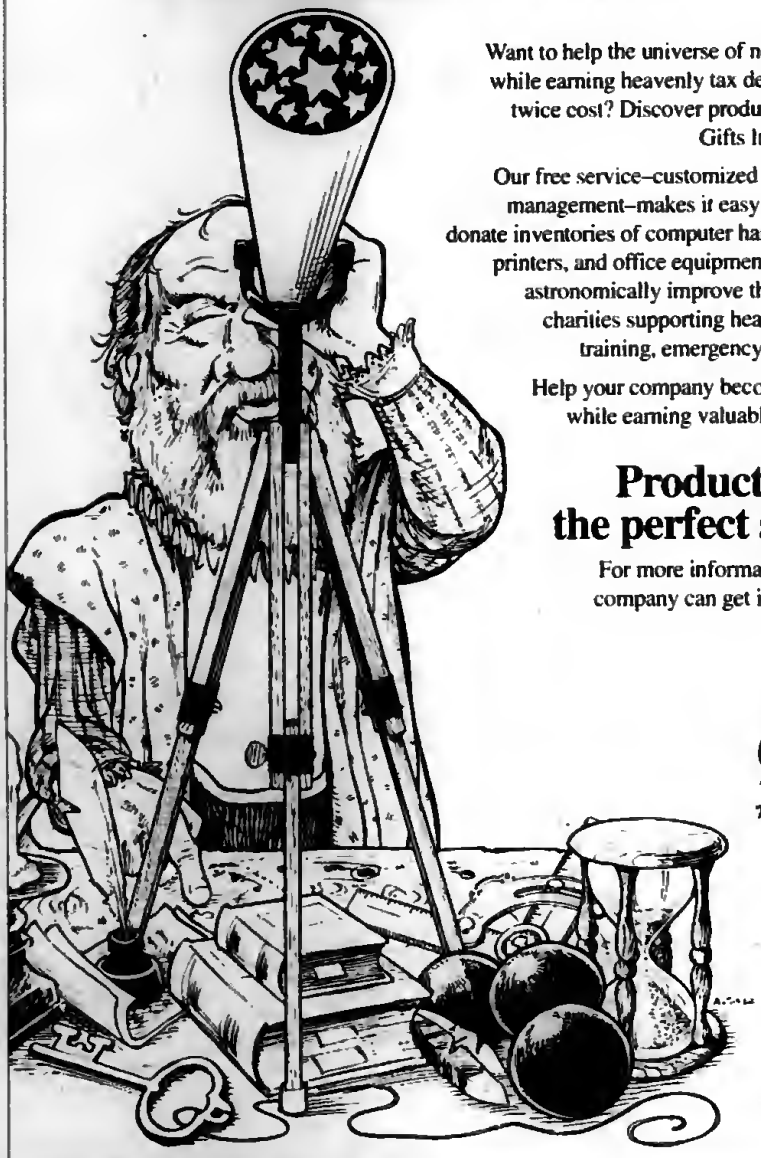
What does this mean in a practical sense? It means that once the project is complete, the operating manager must deliver on his financial commitments. He cannot be allowed to use IS as a scapegoat if he can't meet those commitments.

Senior managers should not view IS and operating managers separately, but as two parts of a whole. Thus, in my proposal, if a given project doesn't deliver on all the commitments the two managers make, then both are held equally accountable. If the IS manager loses his job, the non-IS manager loses his job. No more us and them. As members of a team, each are held responsible for all results.

The point is that we must accept business challenges as a team and work together as a team. In the end, we will either succeed, or in the words of Winston Churchill, "we'll all go down together." ■

Runge is vice president and chief information officer at Wheels, Inc., a fleet leasing and services company in Des Plaines, Ill. He has led teams developing multimillion-dollar client/server systems.

A Brilliant Deduction℠



Want to help the universe of nonprofit agencies while earning heavenly tax deductions of up to twice cost? Discover product giving through Gifts In Kind America.®

Our free service–customized product donation management–makes it easy for companies to donate inventories of computer hardware, software, printers, and office equipment…items that can astronomically improve the productivity of charities supporting health care, housing, training, emergency relief, and more.

Help your company become a shining star while earning valuable tax deductions.

Product giving – the perfect solution!

For more information on how your company can get involved, contact:

GIFTS IN KIND® AMERICA

700 N. Fairfax Street
Suite 300
Alexandria, VA
22314
703-836-2121

Galileo Galilei, Astronomer and Physicist, 1564-1642

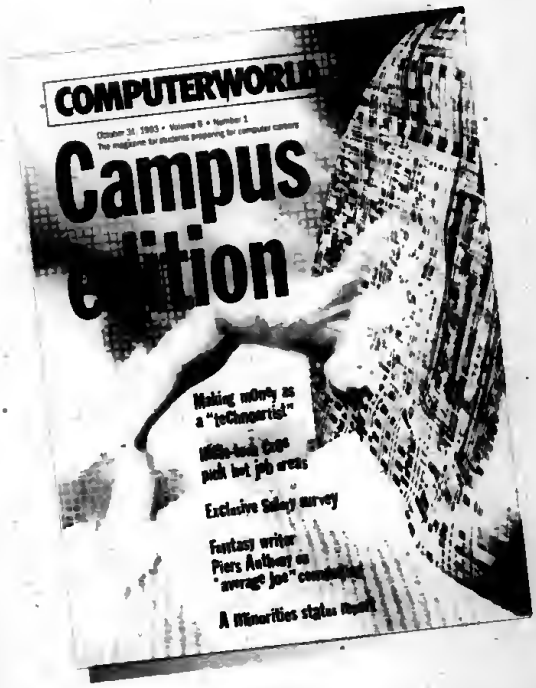
©1994 Gifts In Kind America

Gifts In Kind America…for more than a decade, helping hundreds of leading companies contribute half a billion dollars in products to tens of thousands of charities

Now you have a better way to recruit university and college students planning computer careers:

Computerworld's seventh annual Campus Recruitment Edition

Issue Date: October 31, 1994
Close: September 16, 1994



If you recruit top computer career students on America's campuses, your message in this special issue will target more of them than any other newspaper or magazine!

Now you can recruit computer talent on campus without leaving your office!

That's because 100,000 copies of this special issue will be distributed to America's best and brightest students enrolled in Information Systems (IS), Computer Science, Computer Engineering, Electrical Engineering, and just about any other computer-related curricula.

Finally you can cost-effectively reach the quality and quantity of students you need!

And you can do it with just one ad in *Computerworld's Campus Recruitment Edition!* For a rate card reflecting complete campus distribution, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700). But hurry ... this issue closes September 16, 1994.

Planned Editorial Features:
(subject to revision)

- Companies where computer career students want to work. And their top choices for: Information Systems, Engineering, Sales & Marketing, Technical Support, Research & Development.
- Information Systems salaries from Computerworld's annual survey with the Association for Systems Management
- And much more!

Computer Careers

10 tips for terrific GUIs

by David A. Kelly

"It was horrible," says Mark Hanna, a former Cobol programmer called io to rescue an overly colorful graphical user ioterface (GUI) requisitioo system for the Oklahoma state parks. "The colors slapped you in the face. Red was used for a message box on one window and as a background for the next. There was no continuity between screeos."

To avoid such GUI nightmares, Cobol programmers making the client/server leap must learn not only the GUI environment and tools but also good GUI design principles. Hanna, president of Hanna and Associates, inc., a consultancy in Edmond, Okla., has seen it all, from screens that looked like 3270 screens with function keys instead of clickable button objects to screens so busy that no "white space" was left.

What does Hanna recommend to overcome all the bad GUI designs he's seen? "Put your hands in your pockets," Hanna says. "Don't code. Do design work. The only way to make a good GUI is to do the design work up front. Start with the users and end with the coding."

The **following tips can help you become a better GUI developer and give you an edge over other procedural programmers making the transition**

Create windows. You don't have to cram all the fields onto one window as you would with a 3270 screen. Put pick lists, messages and field-dependent information on subwindows. "It's a big leap for character-oriented programmers to pull information off one window and put in another, but when the information isn't used much, it works well," says Jo-Ann Driscoll, an education specialist at Powersoft Corp. in Concord, Mass.

Make screens clean. "Keep shapes and objects to a minimum and the number of colors low," says Steve Douty, general manager at ETI international, inc. in Sunnyvale, Calif. Screen objects should be balanced with white space.

Be consistent. Use the same font and size for related buttons. Keep the actions the same. "If standards are not followed within an application, it will be very difficult for users to become accustomed to the program," Douty says.

Find out what users will use. You're designing a screen to help someone get a job done, not to try out all the objects. "I've developed some really clever screens with nice displays and then had the users say they don't need all the extra stuff," says Fred Schuff, u former Cobol programmer now working as a contract GUI programmer.

Start with a white board. Instead of spending time prototyping in the GUI environment, hand-draw two or three versions of the most important screens. It's quicker than coding, and you won't get attached to designs that aren't optimal. "Users really enjoy using white board screens to circle things they like or doo't like," says Christine Comaford, president of Corporate Computing, inc. and developer of a GUI design class in Bannockburn, Ill.

Be considerate. Limit the number of fonts and font sizes to three or fnar per window. Avoid the use of italics and serif fonts because they tend to break up on the screen. Use color sparingly. "We recommend neutral colors for the background," Driscoll says. "Avoid the combinations of red oo green or blue on yellow because your eyes will go crazy."

Keep the keyboard involved. Allow for keyboard control nf the screen as well as mouse control. "Too often the monse is used to the exclusion of the keyboard, and then you're stuck if yon sit down at a PC with a broken mouse," says Edwin DiGiambattista, project manager at Chubb Advanced Training, a division nf the Chubb Institute in Parsippany, N.J.

Pick a naming standard. Design a naming convention for your objects, variables and routines and stick with it. GUI systems tend to have numerous modules and objects, rather than just one large program, that must be modified for a name change. "I've become mnch more rigorous in enforcing my naming conventions," Schuff says. "For every half hour you can save by cutting corners, it will cost you an hour later on."

Don't be an inventor. Examine commercial GUI products and use them. "Yon can learn a lot by interviewing the users on what they like or don't like about the Windows applications," Douty says.

Keep it short. You don't have to gather user requirements all at once. "We recommend that developers do two four-hour sessions with users to collect requirements. That's enough information to start designing," Comaford says. ■

Kelly is a free-lance business and technology writer in West Newton, Mass. He can be reached via CompuServe at 71011,2262.

CONSULTING

Contract Solutions is offering long-term consulting opportunities locally and throughout the United States. Most positions pay between $80,000-$130,000 per year.

◆UNIFACE 4GL ◆SUN SYS. ADMIN.
◆RDBMS ENGINE ◆MS WINDOWS DRIVERS, C
◆DB2, CICS, COBOL ◆VISUAL BASIC, C, INGRES
◆AS/400, COBOL OR RPG ◆NATURAL ADABASE
◆NEXT PROGRAMMERS ◆WINDOWS NT, DEV/TEST
◆PROGRESS PROGRAMMER ◆SUNOS KERNAL, DRIVER
◆POWERBUILDER, SYBASE ◆NET MGT GUI, TCP/IP
◆ORACLE V.7 FORMS 4.0 ◆ALPHA AIXP/OSF1, C
◆METHODOLOGY/OOD ARCH ◆ORACLE FINANCIALS R.10
◆SUPRA DBA ◆CINCOM MFG
◆MS DB/DC, COBOL ◆VMS, RDB, C, DECFORMS
◆SYBASE INTERNALS ◆MVS, CSP, DB2
◆EDI, X.12 ◆NETW MGR, TCP/IP

CONTRACT SOLUTIONS

Two Keewaydin Drive
Salem, NH 03079-4875

603-893-6776
Fax: 603-893-4208
800-998- ext 1 (2741)

LOTUS NOTES PROGRAMMER

Templeton Worldwide, an investment management firm in Ft. Lauderdale, Florida is seeking a Lotus Notes Programmer to join our IS team. The successful candidate will program using Lotus Notes in support of Sales and Marketing applications. This position requires 6 months to 1 year of developing Lotus Notes Applications.

As part of the Franklin/Templeton group, we collectively manage almost $115 billion in assets of private money and mutual funds. We are committed to maintaining our position as one of the leading global investment management firms worldwide. Our technology philosophy is to selectively use proven, state-of-the-art equipment, software and services to provide the best possible service to our staff worldwide.

Resumes to J. King, Templeton Worldwide, 500 E. Broward Blvd., Ste. 2100, Ft. Lauderdale, FL 33394, Fax 305/527-2145.

Templeton

EOE

NATIONAL MAINFRAME OPPORTUNITIES

SOFTWARE DEVELOPMENT
- VTAM utilities-MVS Assembler • up to 70k
- Network Protocol- SNA VTAM MVS OS/C 85k
- DB2 Perf. Utility-Project Mgr(6) -Architect specifications MF & Client server 90k
- VTAM internals: 2nd level support or SE 80k
- DASD Specialist or SE, DOS or BAL prog 75k
- JES3 Specialist-diagnostics expert 65k
- Product Mgr-lifecycle product dev & marketing of MF & clientserver utilities (RDB+) 95k

DB2 INTERNALS or Multi RDB/400:
- 1,2,3 level support (repository) 75k
- SE (install & configure conversion tools 70k
- Instructor/Courseware Dev 65k
- Customb (MF) SE's MVS DB2 CICS (GA3+) 85k

Tina Costa 215-655-7999
800-935-1599 fax:215-658-1547
6380 Wilshire Blvd., Suite 1000
Los Angeles, CA 90048

CONSULTANTS
Immediate Interviews
MAINFRAME
DB2/CICS • BAL • ADSO
DB2 or CICS • IDMS • BAL
Natural 2 • Intersolve • VM
Tandem • Sunsoft • Adabas
DASD • CSP • HPS
VTAM • APS • PL1
DB2 4000 • JD Edwards • SMS
CLIENT SERVER
Visual C++ • VAX/RDB • Excel
Powerbuilder • Informix • Sybase
Peoplesoft • Novell • Pathfinder
Telecomm • Oracle • Unix
Lan/Wan • Sybase • Smalltalk
Unisys • Access • C++
Sys/Admin • TCP/IP • Motif
Windows • Testing • MF/Cobol
Windows NT • Vb Basic • OLE 2.0
Robin Rogers Consulting
1212 4th Ave, PO B, NYC 10036
800-828-5998 212-921-1519
Fax 212-302-4063

ANALYSTS/DBA'S/ PROJECT MANAGERS
(PERMANENT/CONTRACT)

VECTOR has several projects nationwide for qualified software professionals in the following areas:
- SYBASE • ORACLE
- VISUAL BASIC • POWERBUILDER
- SMALLTALK • LOTUS NOTES
- UNIX/C/C++ • WINDOWS SDK

Fax or send resume to: Human Resources, Vector Consulting, Inc., 4530 South Berkeley Lake Rd., Suite E, Norcross, GA 30071. Fax (404) 248-0809, Phone (404) 248-0808

CONSULTANTS SHOULD CONSULT
MIMI
IMMEDIATE CONTRACTS
Mimi Simon Assoc
(212) 406-1705
FAX (212) 406-1768

CONSULTANTS
- All Technologies
- Nationwide Openings
- Salaried or Project Basis
- 2+ Years Experience

Send/Fax resume to:
Analysts International Corp.
P.O. Box 39612
Minneapolis, MN 55439
Fax (612) 897-4693

Not in Kansas Anymore

Life hasn't been the same for Wachovia Bank of North Carolina's Bryan Pollard since he added LAN administration to his duties.

By Julie Hart

As a PC specialist, Pollard had become accustomed to starting work at 8:00 a.m., sorting through his mail and programming a little before the first user call ever came in. Since implementing the LAN more than a year ago, however, Pollard's mornings are no longer his own.

"I thought my job would be easier when we moved to a LAN," says Pollard, a project administrator at the Winston-Salem bank. "But it's not."

To make the transition from supporting stand-alone PCs to a networked environment in the bank's audit department, Pollard relied heavily on his own initiative. He taught himself Windows and attended vendor-sponsored training to learn to add users to the network, update user information, reset passwords, disable connections and shut down the server. "In the PC world, I could solve 95% of the problems in minutes," Pollard says. "With LANs, a whole new realm of things can happen."

A difficult hurdle for Pollard was learning how memory affects the network's reliability. He learned the terminology, such as conventional, high, extended and expanded memory, and experimented to see how Windows used the different memory types in order to prevent system lockups.

In addition, Pollard figured out how to store each user's Windows setup files separately on the server. "We worried if the users didn't like the way their screens looked, they wouldn't use Windows," he says. "We keep their setup files separate, so they can make changes to their desktop."

Pollard, 30, began his career as a mainframe printer operator in the Illinois aerospace industry. He learned to program and was hired at the bank three years ago, where he spent much of his time tinkering with PCs. Now, more than three quarters of his day is spent keeping the LAN and attached PCs up and running.

"You must prepare yourself to be service-oriented," Pollard says. "If you thought you were [service-oriented] when you only had PCs, you'd better wake up." For example, Pollard found that users are far more demanding when they are on the LAN. "You're giving them great tools to work with, and they want more, and they want it now."

A big concern, he says, is that problem resolution time has risen from a maximum of 30 minutes to sometimes an hour or more because of complex LAN issues. If a user can't print, for example, Pollard must first find out what printer to look at. "When users log on [to the LAN], they're logging into three servers without knowing it," Pollard says. He must then determine if the connection is down between the PC and the printer, if it's a configuration problem with Windows or Novell, Inc.'s NetWare or if it's something else.

And there are plenty of hurdles. One of the biggest is setting priorities. "I always ask myself, 'How long will it take to solve this problem?' If it takes 30 minutes or more, I'll ask the user how important it is. Often they can wait," Pollard says.

Another hurdle is keeping up with technology. Pollard often spends two to four hours a week reading technical publications. "I do my reading on the job," he says. "A lot of people I know won't do this and end up not reading at all."

Despite the fact that Pollard now misses lunch a couple of times a week and doesn't always get to the gym, he wouldn't give up his job. "The challenges keep me going, and I like the feeling I get when I solve [a user's] problem. It's a great job." ■

Hart is a free-lance writer in Sunnyvale, Calif.

Programmer/Analyst

ITT Transportation Distribution Services, located in Palm Coast, FL is currently seeking a well-qualified professional to be responsible for various systems development efforts related to transportation and general accounting

The qualifications required include:

- Excellent knowledge of the IBM AS/400, database, RPG/III and CLP
- Experience with LANSA (or other case tools) and/or IBM Image Plus
- Bachelors degree in Computer Science or Computer Management
- Ability to complete assignments on time with minimal supervision

ITT-TDS offers an excellent compensation and benefits package. For confidential consideration, please send a resume including salary history and requirements to: ITT-TDS, Attn: Human Resources, 2 Corporate Drive, Palm Coast, FL 32137

No phone calls or agencies please!

An Equal Opportunity Employer

ITT TRANSPORTATION DISTRIBUTION SERVICES

Advancing Careers Through Advanced Technology

Join Florida's Leader In Consulting, Training and Permanent Placement.

COMPUTERPEOPLE

CLIENT/SERVER ENVIRONMENTS
• C • C++ • Smalltalk • Visual Basic
• PowerBuilder • Oracle • Informix • Sybase
• Unix • Windows • WindowsNT • SQL Server

IBM MAINFRAME:
• DB2/DICS • IMS DB/DC

IBM MIDRANGE
• AS400 Programmers with COBOL or RPG400

APPLICATION PACKAGE SOFTWARE:
• Arthur Andersen OCS • COVIA • D&B Software
• MAPICS • PRISM • Software 2000

OCCUPATIONS
• Object Oriented Analysts & Design & Implementation Experts
• Datacommunications Specialists
• Data Base Administrators and Analysts
• Project Planners and Leaders
• Sr. Programmer/Analysts
• Business Analysts

Tampa Bay Area
12225 28th Street North, Suite A
St. Petersburg, FL 33716
800-329-2626 • FAX 813-572-6069

Ft. Lauderdale Area
3265 Meridian Pkwy., Suite 122
Ft. Lauderdale, FL 33331
800-777-8003 • FAX 305-389-0204

Orlando Area
201 E. PINE ST., Suite 1305
Orlando, FL 32801
800-299-9953 • FAX 407-843-8153

SENIOR DATA COMMUNICATIONS ANALYST

Pittsburgh-based financial services firm seeks a Sr. Data Communications Analyst for its Network Operations area. This person will be challenged with the development and support of a wide area network (WAN) encompassing over 150 institutions. Additionally, this person will participate at a senior level in the design, implementation and support of a multibuilding high speed local area network (LAN) for the corporation. Required skills:

- Direct exposure to a wide variety of protocols including: SNA, 3780, Bisync 3270, SDLC, and various gateway technologies with Netware SAA gateway product knowledge a plus
- Working knowledge of network management products, HP Open View preferred
- Frame Relay, T1, SMDS, ethernet, token ring, routers, bridges, IPX/SPX, TCP/IP, and LAT are all currently used or planned transports/protocols
- Experience using test equipment, data scope, and LAN Analyzers for troubleshooting

We offer a competitive compensation package in a challenging professional environment. If you are willing to work hard, learn, and be a part of an energized team of data communication professionals, then send your resume with cover letter and references to: **NAS CONFIDENTIAL REPLY SERVICE, Dept. 8PG28, Three Gateway Center, Suite 1740, Pittsburgh, PA 15222.** Equal Opportunity Employer.

AS/400 Systems Analysts/Programmers

Crate and Barrel is America's most exciting specialty retailer with 50+ stores nationwide. We are seeking analysts/programmers for our expanding AS/400 development group based in our Northbrook corporate office.

Ideal candidates should possess 3+ years experience in an AS/400 environment with an excellent knowledge of RPG/400 and CL programming. Background in CASE tools is desirable. Preference is for candidates with retail and/or distribution experience & good communication skills.

Crate and Barrel offers opportunity for growth in a dynamic, state-of-the-art development environment. We offer a competitive salary and excellent benefit package including health and dental insurance, profit sharing & store discount. Please send resume including salary history to: Crate & Barrel, 725 Landwehr Road, Northbrook, IL 60062, ATTN: D. Ellsworth. Principals Only, Please

Crate&Barrel

DATA PROCESSING PROFESSIONALS

Seltmann, Cobb & Bryant, Inc., a National Data Processing and Information Services Company, has immediate long-term opportunities locally and throughout the Country.

We are currently looking for individuals possessing any of the following skills to fill Programmer Analyst positions:

• IMS DB/DC	• IDMS	• ADABAS/ NATURAL
• DB2	• TELON	• GUPTA
• COBOL	• NOVELL	• ORACLE
• CICS	• INGRES	• CASE TOOLS
• VAX/VMS	• DEC FORMS	• UNIX/C
• AS400	• RPG	
	• POWER BUILDER	

SCB offers competitive salaries, a comprehensive insurance package, employee stock option plan and a 401K program. Take your first step toward making your career complete by sending or faxing your resume to:

Seltmann, Cobb & Bryant, Inc.
Attn: Debbie Pardnock
1375 West Briarbrook Road
Memphis, Tennessee 38138
FAX: 901-756-7497
An Equal Opportunity Employer

SOUTHEAST

Join Computer Consulting Group, one of the Southeast's most dynamic consulting firms, and watch your career soar. We are seeking talented and motivated programmer/analysts and have immediate staff openings through our offices in Richmond, VA, Raleigh and Charlotte, NC, Greenville and Columbia, SC. Our immediate and continuing needs are:

- Network Specialist/ CNE
- Powerbuilder Programmers
- PC Specialist
- RBS
- CICS/DB-2
- UNISYS/MAPPER
- Visual Basic/FoxPro
- DB-2/RAB/Proj. Mgr.
- AS400/COBOL
- VAX/ORACLE

CCG offers competitive salaries, attractive benefits, relocation assistance and MORE! For immediate consideration send resume or call NOW!

Computer Consulting Group
Contract Professional Services

One Monckton Boulevard
Columbia, SC 29206
1-800-222-1273 • FAX (800) 539-3339
Member NACCB

Available AUGUST 1ST for resume posting & job seeking!

Now you can access an online job database of technical careers in the Southwest!

Southwest High Tech

Careers ON-LINE

COMPUTERWORLD

with your computer & modem:

800-252-4820 in TX*

*outside TX: 508-875-2829

(Callers outside of Texas incur the cost of their telephone call.)

This service is available at no charge to job seekers.

Midwest

CONSULTANT - Analyze, design, develop and implement software applications on IBM mainframe, client/server technology, PC, UNIX and VAX/VMS systems using COBOL, CICS, DB2, C, C++, OOPS, Sybase, Powerbuilder, SQL, MS-WINDOWS, JCL, CMF, XPEDITER, INTERTEST, EZTRIEVE, FILEAID, TSO/ISPF and a variety of networks. Provide end-users training and systems support. Req'd: M.S. in Computer Science or Electrical Engineering with 6 mos. exp. in the job offered or 6 mos. exp. in a related occupation such as Research Assistant and/or Consultant. Also coursework in Computer Systems; Experience must include analysis, design and programming on various platforms including IBM mainframe and UNIX systems, languages including COBOL II, CICS and C. 40 hrs/wk 8:00 am - 5:00 pm. $40,000/yr. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202, Ref.# 47394 "Employer Paid Ad".

AIX/CATIA System Engineer wanted for installation of computer applications AIX and CATIA onto IBM RS/6000; network machines together and join into other networking environments; customize the CATIA environment to suit the individual customer and write backup scripts and plot scripts, add in any peripherals such as printers/plotters, modems; ensure that all networks can communicate with these peripherals. Reqs. 3 yrs/exp. and exp. must be in installation of AIX and CATIA applications; 40 hrs/wk, 8 am - 5 pm, $40,000/yr; Send resume to: 7310 Woodward Ave., Room 415, Detroit, MI 48202, Reference No. 80294. "Employer Paid Ad."

Software Engineer, 40hrs/wk, 8-5, $38,000/yr. Enhancing & maintaining current productions PDS (Personal Display System) & DICOM (digital Imaging Communications in Medicine) systems. Designing database schema, data dictionary, & database access routines for PDS & DICOM systems in a relational database environment. Systems analysis, design, coding, testing & customer support. Software configuration management of PDS & DICOM systems. Designing & developing the GUI (Graphical User Interface) for PDS & DICOM using UNIX C/C++, X Window, Shell & SQL/4GL in a distributed computing environment. Min reqs: MS in Computer Science. 2 yrs in carrying out those duties set forth in the job offered or 2 yrs in software engineering development, in designing & developing industry application software, in UNIX C, Shell, SQL/4GL, C++ & X Window programming, & in designing relational database technology using distributed computing environments. Apply at the Texas Employment Commission, Dallas, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778, J.O.#TX7211018. Ad Paid by an Equal Opportunity Employer.

Consultants • Indianapolis • Chicago

Our employee owned consulting firm needs talented individuals to share in our growth. Career oriented professionals with solid technical experience in:

- IDMS/ADSO	- Powerbuilder	- Informix
- CICS, DB2	- Essel	- UNIX
- ADW	- Telon, APS	- Oracle

Ready for a competitive salary, attractive benefits and the chance to participate in our success? Send your resume to:

Sojourn Consulting, Inc.

2 MidAmerica Plaza, Ste 800	10401 N Meridian, Ste 300
Oakbrook Terrace IL 60181	Indianapolis IN 46290
FAX (708) 954-2382	FAX (317) 581-6110

CAD/CAM PROGRAMMER ANALYST - Design and analyze algorithms pertaining to free form surface (B-spline, NURBS) development and evaluation in PDGS CAD/CAM system. Develop software in C, C++ and FORTRAN to implement algorithms in free form surfaces. Maintain and enhance 3D graphics using PHIGS. Maintain and enhance core PDGS system and assist in the port to different platforms. Analyze competitive system, develop specifications, design and code to meet user requirements. Evaluate and assist in the integration of third party component software. Req'd: B.S. in Mechanical Engineering. Also academic background should include: Computer Aided Design; CAD/CAM Systems; Applied Numerical Methods, Engineering Analysis, Advanced Mechanical Vibrations. 40 hrs/wk 8:00 am - 5:00 pm. $41,000/yr. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref.# 69894 "Employer Paid Ad".

ENGINEER - Write programs for real time and hardware-in-the-loop simulations using specialized simulation languages and standard languages C and FORTRAN. Use controls-specific software such as EASY5x, BEACON, Matrix with in-house simulation software to build simulations that run on a Real-Time Station. Conduct short-term courses for our customers, for instruction on the use of in-house simulation software. Will occasionally be required to travel to customer sites to conduct these courses. Will be responsible for helping customers fix bugs in simulations that use our software and hardware. Integrate third-party controls software with in-house specialized software/hardware and provide technical documentation for the same. Work as a part of a team to write user and reference manuals for in-house software and hardware products. Req'd: M.S. in Electrical Engineering or Mechanical Engineering, or Computer Science. Academic background must include courses one each in: Control System Theory, System Simulation, Numerical Linear Algebra, C and UNIX, and Microprocessor Interfacing; Academic experience or thesis in the area of real-time and hardware-in-the-loop simulation with topics in system identifications and control. Also use of [illegible] software like SystemBuild, Matrix and Control-C. Will accept B.S. in Electrical/Mechanical Engineering, or Computer Science plus two years experience in the Job offered in lieu of required education and special requirements. 40 hrs/wk 8:00 am - 5:00 pm. $3,079.99/mo. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref.# 50894 "Employer Paid Ad".

The Future Belongs To Those Who Can Go Beyond The Obvious.

We're Thomson Consumer Electronics, the manufacturer of RCA, GE and ProScan brand consumer electronics products. If you have the vision, we have the environment.

Marketing & Sales Application Systems Manager

You will implement and manage systems development projects for the Marketing and Sales, Product Management and Industrial Design Groups. To succeed, you will need a B.S. degree in Computer Science or related field with 7+ years applications development experience in a Marketing/Sales environment. Management experience essential. An MBA preferred.

Send your resume and recent salary history to: Professional Relations, #4064, INH 110, Thomson Consumer Electronics, P.O. Box 1976, Indianapolis, IN 46206-1976 or fax a resume to: (317) 587-6762.

THOMSON CONSUMER ELECTRONICS

We rely on diversity to fuel innovation. EOE. M/F/D/V.

Available AUGUST 1ST for resume posting & job seeking!

Now you can access an online job database of technical careers in the Southwest!

Southwest High Tech

Careers ON-LINE

COMPUTERWORLD

with your computer & modem:

800-252-4820 in TX*

*outside TX: 508-875-2829

(Callers outside of Texas incur the cost of their telephone call.)

This service is available at no charge to job seekers.

SYSTEMS ANALYST: To assist in analyzing, designing, developing, implementing and maintaining management, financial and business software for large business systems in scientific and technological industries. Will interact with clients to analyze data and business processes unique to such industries, for automation; design the automated systems to client specifications, develop algorithms and implement them using C++ or other Object Oriented language. Will document application specifications and will test and maintain the software. Must have B.S. in any field of engineering, science, math, computer science field with demonstrated ability to program in C, C++, C/Bourne shell, LEX and YACC and demonstrated knowledge of UNIX and DOS internals as well as algorithm, theory, computer architecture and data structures as evidenced by course work or letters of experience. Extensive domestic travel on short notice. 40 hrs/wk (9 to 5): $37,000.00/year. Send resumes to 7310 Woodward Avenue, Room 415, Detroit, MI 48202. Reference No. 44694. Employer Paid Ad.

Release/Systems Engineer to design software algorithms to control automatic transmissions using MICROSOFT WORD, EDSNET (TSO); verify code written in Assembly language on Motorola 68HC11 Microprocessor; develop program timing charts for these controllers from development phase to production phase; approve all hardware features on Transmission Control Modules (TCM); release controllers (TCM) sold to customer vehicles; review technical work performed by others; Reqs. Bach. in Computer or Electrical Engg., 6 mos. exp. in job offered or 6 mos. related exp. as Systems Engineer. Related exp. must include software design & software coding on Motorola 68HC11 Microprocessor. Must have 1 univ. course each in: Microprocessors, Control System Design, Micro Systems Design; $38,800/yr., $28/hr. OT, 40 hrs/wk, 8a-4:30p. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref. #74194 "Employer Paid Ad"

Programmer/Analyst: Writes, maintains, programs, and performs system administration of a Unix-based environment using Hewlett Packard workstations. Supports company's network (Ethernet) and communication protocol (TCP/IP) for purposes of insuring compatibility in appropriate systems. Designs and implements database systems on DOS environment using relational database theory, Paradox 4.0 and PAL in a network environment. Writes and maintains programs in Quick Basic 4.5. Requires Bachelor's degree in Computer Science or Electrical Engineering & Computer Science with concentration in Computer Science. Also requires six months experience in the job to be performed. Education to include completion of one project in which a database was established using Paradox 4.0 and one project in which data was retrieved using PAL in a network environment. In lieu of six months in the job offered, will accept six months graduate research or six months as a Computer Consultant, Computer Laboratory, in which the individual performed system administration in a Unix-based network environment. Hours: 8:00 a.m. - 5:00 p.m. 40 hours [illegible] week at $32,000 per year [illegible]. Must have proof of le- [illegible] in the U.S. Please send two copies of resume to: Illinois Department of Employment Security, 401 S. State St. - 3 South, Chicago, IL 60605, ATTN: Joan Sytsma, Ref. #V-IL 11714-S, No Calls. An Employer Paid Ad.

COMPUTER PROFESSIONALS!

Join our team of skilled technical professionals and discover exciting career opportunities at high growth national payroll service company. Due to expanding business, the following opportunities are available for candidates with strong communication skills and proven ability to work in a fast-paced team environment.

Oracle DBAs

Minimum 2 years Oracle development experience on UNIX. DBA experience a plus! Challenging support position with development project responsibilities. Includes physical design, account and security administration, back-up and recovery, performance tuning and capacity planning. SQL*Forms and SQL*Plus desired.

Lead Quality Assurance Analyst

5 plus years software QA experience. Strong background in test methodology and project leadership experience required. Windows testing is a plus! Lead and supervise a group of 3-5 individuals, develop testing standards and procedures, and participate on project teams!

Fax or send resumes immediately to:

Beth Scheckman - ADCW
Paychex Incorporated
911 Panorama Trail South, Rochester, NY 14625
Fax: (716) 383-3400

PAYCHEX®

COMPUTER PROGRESS UNITED

We provide Fortune 500 companies with consulting and programming services. We have immediate positions available for:

TELON ■ ORACLE
Child Welfare Sys
DB2 ■ IMS ■ CICS

Send resume or call
Computer Progress United
12730 Townepark Way
Louisville, KY 40243
(502) 245-6000

Coopers & Lybrand Consulting

Current long term engagements are available in OKLAHOMA and ARKANSAS. We seek Programmer Analysts with 2+ years experience in any of the following areas:

COBOL/CICS	POWERBUILDER
DB2/IMS	INFORMIX/ORACLE
IDEAL/NATURAL	C++/WINDOWS
IEF	AS 400/COBOL or RPG

We offer a competitive compensation package on either a project or salaried basis. As an employee of Coopers & Lybrand Consulting you gain the benefits of working for a "Big 6" firm which includes training in the latest technology and opportunity for career enhancement. Send or fax your resume to:

Coopers & Lybrand Consulting
4200 E. Skelly Drive, Suite 352
Tulsa, Oklahoma 74135
Fax: 918/495-3652
Phone: 918/492-7775

EOE/AA M/F/D/V

Computer Professionals

Morton Offers A Unique Fringe Benefit: UTAH

Salt Lake/Ogden has been described as one of the "Ten Great Cities of Opportunity". An impressive growth rate and the numerous high tech industries that have located here have continued to keep Utah's future prospects bright and ambitious. Morton has been developing life saving airbag technology since 1968 and leads the world in the production of driver - and passenger - side inflators. Our rapid and continued growth has created opportunities for the following professionals:

Systems Analyst

Support critical business systems translating client requirements into applications, including planning, design, development, testing, training, information installation and maintenance. Requires experience working with medium and large business systems related to manufacturing processes, technical knowledge in database and application design, event-driven systems and object-oriented programming, as well as CASE-based analysis or decision-support system development. Familiarity with LBMS, PowerBuilder, Lotus Notes and Oracle 7 is preferred; experience with ISO 9000 a plus. Background in the automotive supply industry a definite asset. Code RAP-01.

SQA Analyst

Audit the software quality assurance activities of software development groups in a multiplatform environment. Recommend and review configuration management policies and assist in the development of software engineering teams' quality plans. Establishment and maintenance of test case scenarios and auditing of projects for conformance to standards. This position requires a minimum of two years experience and a degree in BS CS or related field. Code RAP-02.

Software Engineer

Work on application development, requiring experience with PowerBuilder, Visual Basic or Visual C++, knowledge of Oracle 7 DBMS and CASE tools, UNIX and a thorough understanding of software development methodologies. Minimum 3 years software development experience, and BS/CS or related is required. Code RAP-03.

In addition to our excellent fringe benefits, competitive salaries and professional working environment, you'll be located in the heart of the Rocky Mountains. You'll be close to some of the world's best skiing and enjoy the excitement of outdoor activities such as camping, hunting and fishing, also sophisticated cultural amenities, affordable housing and a relatively low cost of living.

Please send your resume, including salary history, and specify code and position of interest, to: Morton, Automotive Safety Products, P.O. Box 3767, Ogden, Utah 84409. *Equal Opportunity Employer M/F/D/V.* Principals Only Please!

Morton

DATA AID INC

PEOPLE WHO KNOW COMPUTERS.

Join our growing team of professionals in Birmingham, Atlanta and surrounding cities. We want you if you have experience in the following:

Great pay and benefits.
Send resume to:

800-967-6878
205-967-6878
Fax: 205-967-1014

TOP $$$ HIRING NATIONALLY

Please call us for more details! Min 1 yr exp salary of these skills...

CLIENT SERVER

*Sybase DBA *Oracle DBA
*Informix DBA *Sybase P/A
*Oracle 6 or 7 *Informix P/A
*Oracle Case *Oracle Pharmetals
*SQR *Powerbuilder 3.0
*Visual C++ *Visual Basic 3.0
*Windows SDK *Windows NT
*OLE 2.0 *Peopsoft
*Smalltalk *OS/Mosif
*OS/2 C or PM *SAP R2 or R3

MAINFRAME

*Cobol/Cobol II *DB2/CICS
*DB2 or CICS *Natural/DB2
*IMS DB/DC *IDMS/ADSO
*Telon *APS or HPS
*Tandem *Bristol
*JD Edwards *Syncsort

SYSTEM ADMIN/NETWORK

*Unix or AIX *Sun/os
*Solaris *TP-UX Operation
*Help Desk *DEC or AT&T
*Novell *Banyan
*TCP/IP *LU6.2 or X.25

All calls/resumes kept confidential

Data Network System Inc
53 Wall St, 5 fl, NY, NY 10005
or
1 Gateway Center, Ste 2800
Newark, NJ 07102-5397
908-870-3474
Fax 908-870-0611
EOE-Citizen/Non-citizen

EMPLOYMENT OPPORTUNITIES FORTE SYSTEMS INC FOR THE COMPUTER PROFESSIONALS

Forte Systems, Inc., a rapidly growing Software Development Consulting Company, has numerous opportunities for career minded professionals. Opportunities available at various locations in the United States.

- ORACLE 7.0
- FORMS 4.0
- POWERBUILDER
- SYBASE
- UNIFACE, JAM
- BUSINESS PROCESS RE-ENGINEERING and DATA MODELING
- SMALLTALK, VISUAL WORKS, C++
- AS/400, RPG/400
- DB2, IMS, CICS
- ADW, IEF

Forte Systems, Inc. offers competitive salaries, comprehensive benefit packages and relocation assistance. For immediate consideration send resume or call:

FORTE SYSTEMS, INC.
Phone (818) 649-2202
Fax (818) 649-1296
Internet: 72634,3045@compuserve.com

MO' MONEY!

Nationwide Opportunities
Permanent and/or Contract

MVS
ORACLE 7
SMALLTALK
ADABAS DBA
AS/400 RPG
DB2 / CICS
IMS DB/DC
Others

Please mail/fax resume to:

ABII
P.O. Box 20242
Overland Park, KS 66208-0242
fax (913) 651-8884
call (800) 776-6177

Available AUGUST 1ST for resume posting & job seeking!

Now you can access an online job database of technical careers in the SOUTHWEST!

Southwest High Tech

Careers ON-LINE

COMPUTERWORLD

with your computer & modem:

800-252-4820 In TX*

*outside TX: 508-875-2829

This service is available at no charge to job seekers.

(Callers outside of Texas incur the cost of their telephone call.)

This Space for HIRE! CALL:

800-343-6474

in MA., 508-879-0700, ask for John Corrigan, Vice President Classified Advertising.

COMPUTERWORLD

Weekly.
Regional.
National.

And it Works!

PCS GROUP, a recognized provider of management consulting, client server integration services and a Sybase Teaming Partner, has immediate openings for:

- **COBOL/CICS/VSAM: 4 yrs of experience**
- **COBOL/DB2: 3 yrs of experience**
- **POWERBUILDER: must have 6 months development experience and be a US citizen.**
- **Lotus Notes: development experience**

PCS Group offers exceptional training opportunities in our state-of-the-art training facility, outstanding incentives and excellent benefits. For immediate consideration, please send or fax your resume to:

PCS GROUP

9300 Shelbyville Rd., Suite 1103
Louisville, KY 40222
502-339-2900 • 800-682-6784 • FAX: 502-339-2888

Powers Case Consulting Services, Inc.

Top Pay for Highly Talented and Motivated Individuals

Requires above average IEF skills in one or more of the following.

- Full Life Cycle Development Maintenance and/or Client Server
- Project Management
- Encyclopedia Administration
- Course Development/Instruction

Requires above average skills in one or more of the following areas. IEF or CASE is a plus but not a requirement.

- UNIX C
- Network Installation
- JAD Facilitation

Send Resume or Fax to:
Powers Case Consulting Services, Inc.
8720 Skyrock Court
Columbia, MD 21046
Att: Midge Powers
Vice-President Marketing & Recruiting
Fax 410 381-4213

Programmer Analyst - Plan, develop, & test cmptr prms for fin'l, dispatch oper, stat anlys, & acctng mgmt syst. Intensify oper procedures & prgm objtve. Outline steps req'd to dvlp prgm using structured anlys & design. Prepare flowcharts & dgrms to show steps prgm must follow & to describe logical opers invlvd. Design screen displays. Converts reqmts into prgm specs by detailed instrs for coding into cmptr processable lng. Enter prgm code & run & test prgm. Use diagnostic s/ware to detect syntax & logic errors. Replace, delete & modify code to correct errors, increase efficiency & adapt to new reqmts. Writes domt & manual to describe prgm dvlpmt, logic, coding, correction, installation & oper procedures. Use cmptr-aided s/ware tools (flowchart design & code generation). Train & provide help to users. Install & monitor prgm. Use Programs RDBMS/4GL, Cobol, C, UNIX, UNISYS5000/70, & Novell Netware. Resume in dpl to A. Ben-Zion, Fleet Mgmt, 250 W 57th St, NYC 10107.

Software Engineer: Mntnr of team rspnsbl. for mdfyng., sustaining., & enhncng. iRMX real-time oprtng. syst. prdct. that runs on multpl. HW configrations. Resp. for sustaining & enhncng. ntwrkng. subsyst. in operating sys., incldng. provision of SW spprt. for various ethernet LAN contrllrs., dvlpng. enhncmnts. to TCP/IP & ISO's OSI standard ntwrkng. subsys. & sustaining POSIX layer in oper. sys. Min. 40/wk. Rqmnts.: MS/Comp. Eng. or MS/Elec. Eng. w/comp. eng. emphasis, or MS/Comp. Sc. w/comp. eng. emphasis, proven "C" prgrmmng. skills in large projs. knwldg. of UNIS oprtng. syst., knwldg. of TCP/IP & OSI; undrstndng. of comp. HW, prvn. ablty in debggng. $3,730/mo., job in: Hillsboro, OR. Qual. applcnts. send res. to: Employment Dep't., Attn: Job Order #5550740, 8875 Union St., N.E., Rm. 201, Salem, OR 97311. Applicant must have legal authority to permanently work in U.S. The comp. is an Equal Opp. employer & fully supports affirmative action practices.

Software Engineer Duties: Software project development ranging from analysis and design to validation and implementation for large on-line and batch-oriented business applications in a multi-hardware/software environment. Distributed database administration. Design of software productivity tools. Technical support. User training. Tools: SSAD techniques; VAX/VMS; VAX/Rdb; Paletta; C; SQL; Motif; GUI's; DECnet/SNA networks; DECast for VMS. B.S. in Computer Science as well as three years experience as a Software Engineer or Systems Analyst/Programmer required. Previous experience must include: VAX/VMS; VAX/Rdb; C; DECast for VMS. Additional three months experience with Paletta and Motif. 40hrs/wk., 8am - 5pm, $47,000/year. Send resume to: 7310 Woodward Avenue, Room 415, Detroit, Michigan 48202. Reference No. 47894. Employer Paid Ad.

Systems Analyst for Computer Systems & Software Services, Suffield, Ohio. Performance of broad variety of proprietary financial/accounting applications computer systems software design services in COBOL and COBOL II/CICS, JLC and ALC languages on IBM mainframes. Consultation with client management to maximize user efficiency. Required: Willingness to travel and/or relocate to variable client job sites throughout U.S.A. at three to six months intervals. Bachelor's in Computer Science, Business or Accounting and two yrs. exp. in job offered. 40 hrs./wk., 9-5, Mon-Fri, $38,950.00/yr. Must have proof of legal authority to work indefinitely in U.S. Send resume in duplicate (no calls) to J. Davies, JOB #00478, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, OH 43216.

SYSTEMS ANALYST/PROGRAMMER (Southfield, MI): Consult w/multidivisional co. clients re sophisticated info processing reqmts. Perform system analysis & prgrmg tasks for design, installation, maintenance & troubleshooting of PC based on-line & platform based relational database managmt systems. Design test data suites & conduct compliance testing. Train user clients & DP personnel in operation & technical aspects of systems & programs & provide work documtn. Exercise technical supervision over 1 or more programs assigned to project. Utilize on-site hardware/software as follows: Microsoft Windows, DOS, SDK Toolkit & C language; database Informix 4th GL running under UNIX. Bach. in Comp Sci, Bus Mangmt or Acctg + 3yrs exp. reqd. 40 hrs/wk, 8am-5pm, $44/yr. Send resumes to 7310 Woodward Ave., Rm: 415, Detroit, MI 48202, J.O. #52884.

All across the United States, software professionals are discovering new ways to expand their opportunities with CTG. As the area's oldest and largest integrated information technology services company, we service an impressive list of Fortune 100 companies.

We also provide an outstanding array of benefits, highly competitive rates and the security and career options that only a growing industry leader can offer.

Whether you're interested in a regular salaried or hourly staff position, you'll discover the widest array of professional opportunities available, at CTG.

8001 Broadway, #201
Merrillville, IN 46410
Phone (800) 214-2820
Or Fax to (800) 214-2720
EOE M/F/D/V

ctg

Chicago, IL

ADA	IMS DB/DC
CICS/DB2	Client/Server

Cincinnati, OH

IMS DB/DC	Oracle	DB2
PACBASE	Sybase	CICS

Cleveland, OH

ADW	Dec Forms	GUI
CICS/DB2	OOP	Small Talk
RDB	EDI	OS2

Columbus, OH

DB2	CICS	AS/400
IMS DB/DC	Sybase	

Detroit, MI

Oracle	DB2	AS/400
ADW	CICS	

Ft. Wayne, IN

VAX	Fortran
SMARTSTAR	IBM Main Frame & Mid Range

Grand Rapids, MI

Oracle	DB2/CICS	Powerbuilder
Oracle Case	IMS DB/DC	AS/400 / SYNON

Indianapolis, IN

ADW	Oracle
SAS AF & SCL	DB2

Milwaukee, WI

VAX	DB2	OOP
Oracle	CICS	

Merrillville, IN

DB2/CICS	Microfocus COBOL

Senior Programmers

Wolfram Research, Inc., maker of *Mathematica* software, is growing fast and is seeking professionals to develop business applications on a Unix base RDMS. Positions are available for bright and energetic programmers and project leaders. Both full time and part time positions are available.

Experience in building and maintaining manufacturing, accounting and other business applications using a state of the art database system required. Must be comfortable in a Unix environment programming with C or 4GL. Knowledge of Macintosh, DOS environments and principles of software license management necessary.

Send resume to: Personnel Manager, Wolfram Research, Inc., 100 Trade Center Drive, Champaign, IL 61820. AA/EOE

ECOM
The Computer Consultants

Leading edge development opportunity available for an ORACLE DBA with ORACLE 7.0 INSTANCE and BETA test site environment exp. Long term contract.

ADABAS/CONSTRUCT contract position available

ECOM
10333 NW Fwy Ste 414
Houston, TX 77092
Phone: (713) 686-8740
Fax: (713) 686-9454

Software Engineer III for firm in NE Ohio. To design & develop computer software system for a next generation plant automation environment based upon Advanced Networked Systems Architecture (ANSA), Common Object Request Broker Architecture (CORBA), & Distributed Computing Environment (DCE) specifications. To develop functional & performance requirements & develop functional extensions for a next generation object-oriented distributed real-time operating system using Mach 3.0 & object-oriented programming (C++), for use in industrial automation. To apply both real-time & non-real-time object-oriented analysis & design methodologies in the systems development process. To develop & direct software system testing procedures, programming, & documentation. Must have M.S. in Computer Science or Computer Information Systems. Academic program must have included one course each in the following areas: Advanced Operating Systems, Distributed Systems, & Computer Networks. Must have 1 yr exp in job described above or 1 yr exp as software engineer (exp may be gained before, during, or after degree). Exp must have involved distributed real-time operating systems (DROS) as well as object-oriented analysis & design & object-oriented programming (C++). 40 hrs/wk, 8:00am-5:00pm, $42,000/yr. Must have proof of legal authority to work indefinitely in U.S. Send resume & course transcript in duplicate (NO CALLS) to J. Davies, JOB #00842, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, Ohio 43216.

SAP SENIOR MANAGER (8 openings): Manage consulting services primarily to major multinational, corporate clients of accounting and consulting firm in order to implement SAP software systems. Advise clients on configuring, installing and testing massive and complex SAP modules that integrate engineering, production, accounting, financial and other management data in a real-time environment; allow immediate transmission of on-line entries through clients' worldwide computer network; and convert data to language and currency of foreign office. Recommend alternate business processes to clients that optimize SAP system capabilities and improve corporate profitability. Train clients' employees in SAP systems use, operation and maintenance and the change associated with them. Req'ts: Bachelor's Degree (or equivalent) in Computer Science, Management Information Systems or Business Administration (non-U.S. Bachelor's Degree acceptable when U.S. equivalency has been determined by U.S. educational evaluation agency). Must have six years' experience in the above job duties. Must be able to spend 70% of the time in the field at clients' business locations. 40 hrs/wk; Monday through Friday, 8 AM to 5 PM. Salary: $140,000.00-$180,000.00/yr. Job/Interview Site: St. Louis, Mo. Clip ad & send resume: Frank Evans, Recruiting Director, 250 East Fifth Street, Suite 1600, Cincinnati, OH 45202 or Jim Quigley, Partner, One City Centre, St. Louis, MO 63101-1819. Ad Paid by an Equal Opportunity Employer

Project Engineer, Business Software Systems, for information systems support consulting firm in N. Canton, OH-Analyze software requirements & design UNIFACE front-end tools for multimillion dollar business systems (financial accounting/inventory controls/invoicing/order processing/production systems) & database management including Sybase, Oracle, dBase III+, [illegible] DOS/Windows & Unix System V, VAX/VMS, SQL, Unifacs-4GL, SQR, Lotus 123/VP-Planner & Novell Netware. Responsible for software project management: plan conceptual schema, prepare technical proposals, oversee the design, implementation, enhancement, conversion & quality assurance of software/databases, estimate time/manpower, define transaction boundaries & provide user training. Requirements: BS in Information Systems or Computer Science, & 3 yrs exp in the job described or 3 yrs systems analysis exp, or if without degree, 5 yrs exp in the job described or 5 yrs systems analysis exp. Must have exp in developing software for business systems including financial accounting/inventory controls/monitoring & invoicing/ordering processing/production systems, & Sybase, Oracle, dBase III+, [illegible] DOS/Windows & Unix System V, VAX/VMS, SQL, Unifacs-4GL, SQR, Lotus 123/VP-Planner, Novell Netware, software quality assurance & technical proposal preparation. 40 hrs/wk, 8am-5pm Mon-Fri, $72,000/yr. Must have proof of legal authority to work indefinitely in U.S. Send resume in duplicate (no calls) to J. Davies, JOB #00850, Ohio Bureau of Employment Services, PO Box 1618, Columbus OH 43216.

imagine

I am not a vaporware sales consultant. I feel like more of an entrepreneur. I need a company where I'll fit in. I want to deliver

working for

technology today. Not just talk about it. I'd rather be partnered with the leaders in internetworking hardware, delivering the

a company

best products available for end-to-end networking solutions. I've got experience designing and installing LANs and WANs

that doesn't just

with advanced data networking services. I know what needs to be done. Now all I need is the right opportunity to do it.

talk about

INTERPRISE Networking Services is looking for product marketing managers, product marketing engineers, systems and senior engineers. Call 1-800-DATA-USW,

networking services.

ext. 350 today for complete job descriptions and background information. Or access us at: http://www.careermosaic.com/cm/uswest.html

!NTERPRISE
NETWORKING SERVICES FROM US WEST™

Available AUGUST 1ST for resume posting & job seeking!

Now you can access an online job database of technical careers in the SOUTHWEST!

Southwest High Tech

Careers ON-LINE

COMPUTERWORLD

with your computer & modem:

800-252-4820 In TX*

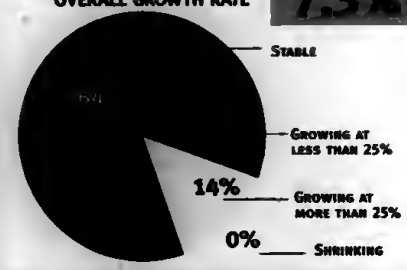
*outside TX: 508-875-2829

(Callers outside of Texas incur the cost of their telephone call.)

CAREER SURVEY: Project Management Software

INDUSTRY HIRING TRENDS

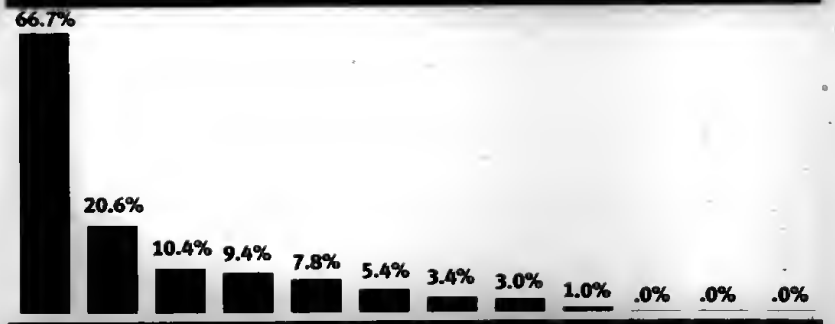
OVERALL GROWTH RATE 7.3%



[illegible] 50 technology firms involved in project management software [illegible] between August '93 and July '94.

© Copyright 1994. Corporate Technology Information Services, Inc., Woburn, Mass.

REGIONAL GROWTH ANALYSIS



[illegible]

CorpTech, a directory publisher in Woburn, Mass., tracks the U.S.' 35,000 technology manufacturers. This survey relates to the 27,977 tracked firms with fewer than 1,000 employees.

PROGRAMMER/ANALYST: 40 hrs./wk. 8am-5pm, $38,500/yr. Carry out the development of s/w application systems on IBM mainframes utilizing MVS, CICS, CSP, SQL, REXX, DB2 and IMS-DB software. Prepare program specifications, test data and carry out unit/system testing and technical documentation. Req: Bachelor's degree in Computer Science, Electronics Engineering, 1 yr. exper. in job offered or 1 yr. exper. as System Consultant/Officer/Engineer. Experience in developing s/w systems on IBM mainframes utilizing MVS, CICS, CSP, SQL, REXX, DB2 and IMS-DB. "Employer paid ad". E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No: 84694.

SOFTWARE ENGINEER: 40 hrs./wk. 8am-5pm, $43,800/yr. Design and development of software application systems on IBM 3090 mainframes utilizing MVS, COBOL, CICS, DB2 and DATACOM-DB. Prepare external/internal design, program specifications, prepare test plans and assist in technical documentation. Req: Bachelor's degree in Computer Science, Electrical Engineering, Mathematics, 3 yrs. exper. in job offered or 3 yrs. exper. as Programmer/Analyst. Experience in developing software systems on IBM 3090 mainframes utilizing MVS, CICS, DB2, COBOL and DATACOM-DB. "Employer paid ad." E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No: 77894

Sunbelt Opportunities

ORACLE P/A's, DBA's ...AZ, FL, NC
SYBASE P/A's, DBA's ...GA, TN, NC
POWERBUILDER P/A's VA, NC, NC
AS/400 P/A's ...NC, VA, TN, TX, KS
TANDEM P/A's ...AZ, TX, VA, CO, [illegible]
HP 3000 P/A's ...[illegible], LA, NC
DB2/CICS P/A's ...NC, AZ, FL, MD
ADABAS P/A's ...NC, GA, [illegible]
PC (OS/2,C) P/A's ...FL, TN, NC
UNIX/C++ P/A's ...GA, FL, NC, [illegible]
HOGAN P/A's ...TN, GA, NC, OH
EDP Auditors ...AZ, GA, FL, MD, [illegible]

[illegible]

SUNBELT RECRUITERS
[illegible] E. Flamingo Road
Las Vegas, NV [illegible]
Attn: Rick Young, C.P.C.

SOFTWARE ENGINEER: 40 hrs./wk. 8am-5pm, $41,000/yr. Carry out the development of s/w application systems on IBM 3090 mainframes utilizing MVS, COBOL, CICS, DB2 and PL/I. Prepare program specifications, prepare data and test plans and provide assistance in implementation of the system. Req: Bachelor's degree in Computer Science, Electrical/Communications Engineering, 1 yr exper. in job offered or 1 yr. exper. as Systems Analyst/Assistant Systems Analyst. Experience in developing s/w systems on IBM 3090 mainframes utilizing MVS, COBOL, CICS, DB2 and PL/I. "Employer paid ad." E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No: 84694

SOFTWARE ENGINEER: 40 hrs./wk. 8am-5pm, $44,200/yr. Develop computer s/w application systems on IBM 3090 mainframes utilizing MVS, CICS, DB2 and COBOL. Prepare program specifications, perform unit and system testing and prepare user documentation. Req: Bachelor's degree in Computer Science, Electrical Engineering, 3 yrs. exper. in job offered or 3 yrs. exper. as Systems Analyst/Programmer/Engineer. Work experience in design and development of computer s/w application systems on IBM 3090 utilizing MVS, CICS, DB2 and COBOL. "Employer paid ad." E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No: 81894.

TANDEM
COBOL, PATHWAY, TAL, SCOBOL, C, SQL, X.25
STRATUS
PL1, COBOL, C, ON/2
[illegible]
SUN, HP, RS/6000, GUI, SDK, Powerbuilder, C++, Visual Basic
Fulltime/Consulting Positions available in the US/ABROAD
STRATEM
800-582-JOBS
TEL (212)967-2910
FAX (212)967-4205
124 W. 30th St. Suite #302
New York, N.Y. 10001

Available AUGUST 1ST for resume posting & job seeking!

Now you can access an online job database of technical careers in the SOUTHWEST!

Southwest High Tech

Careers ON-LINE

COMPUTERWORLD

with your computer & modem

800-252-4820 In TX*

*outside TX: 508-875-2829

This service is available at no charge to job seekers.
(Callers outside of Texas incur the cost of their telephone call.)

VITAL COMPUTER SERVICES

a leading consulting firm, has long & short term projects in the NYC Metro area. Top Rates.

UNIX SYSTEMS ADMINISTRATORS
assist with the installation & implementation of new systems utilizing UNIX (SVR3, SVR4)

SYBASE DBAs or DATAEASE

VISUAL BASIC

State of the art environment all new development

Please call or fax resumes to Chris, Vital Computer Services
(212) 874-3400
Fax: (212) 529-5747

VSE/CICS SYSTEMS PROGRAMMER

Dover Elevators is a major division of a Fortune 200 company utilizing IBM ES/9000 host technology in a multi platform environment. Challenging growth opportunity at our nat'l headquarters requires 7 yrs. successful exp. in a VSE/CICS setting. [illegible] and TCP/IP knowledge a plus. We offer an excellent compensation package including retirement plus 401-k. Send resume w/salary requirements to: Human Resources Dept., Dover Elevator Systems, P.O. Box 2177, Memphis TN 38101

DOVER ELEVATORS

Supports Equal Opportunity for All Regardless of Race, Creed, National Origin, Sex, Age, Disability or Veteran Status.

Applications Programmer (Houston, TX area client site) Develop, code, test, maintain and document financial and commercial applications systems, using CSP, COBOL, and DB2 on IBM mainframes. Bachelor's degree in Math, Comp. Sci., Engineering, or Business Admin. and 1 yr. exp. in job req., or will accept 3 yrs. of exp. in lieu of Bachelor's degree and 1 yr. exp. 40 hrs/wk, 8:30-5, $33,500/yr. Apply at the Texas Employment Commission, Houston, TX, or send resume to the Texas Employment Commission, TEC Building, Austin, TX 78778, J.O.# TX7211719. Ad Paid by an Equal Opportunity Employer.

Programmer Analyst to design & develop product evaluation system for major automotive manufacturer using IMS/DB2 Database; Reqs: Bach. in Computer Science, Computer Information Systems, Systems Analysis or equiv. in ed. & exp., 2 yrs. exp. in job offered or 2 yrs. related exp. as Systems Analyst/Programmer, Contract Analyst/Programmer, Contract Systems Analyst. Related exp. must include, in whole or part, software development on IBM mainframe using COBOL II & IMS/DB2. $44,000/yr. 40 hrs/wk 8a-5p. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref. #67364 "Employer Paid Ad"

BE ON THE FOREFRONT OF INFORMATION TECHNOLOGY

Society Corporation and KeyCorp have recently joined strengths to form what can only be called one of the most powerful financial services companies in the industry today: ***The new KeyCorp.***

With combined assets of $61.5 billion and prominence as the country's 10th largest bank holding company, we remain steadfast in our commitment to excellence in both customer service and product delivery.

Key Services Corporation, a KeyCorp subsidiary, achieves customer service of unmatched quality and strives to be a world-class provider of information, technology, and operational services and solutions.

Our commitment to apply leading edge technology to our corporate-wide mainframe and PC systems has created exciting career growth opportunities for individuals who are interested in a dynamic environment.

The following exceptional opportunities currently exist:

• PROJECT MANAGERS • SYSTEMS ANALYSTS
• PROGRAMMER ANALYSTS • BUSINESS ANALYSTS • SYSTEM ARCHITECT
• BUSINESS AND PROCESS MODELING ANALYST

Qualified candidates must have solid experience and proficiency in one or more of the following technologies:

• DB2 • CICS • DB2/2 • COBOL • GUI • CLIENT/SERVER
• PC/MAINFRAME • VISUAL BASIC • MICROSOFT ACCESS

KeyCorp offers an attractive compensation/benefits package and interpersonal development. Please submit your resume in confidence to:

KeyCorp
Corporate Employment/IS
127 Public Square
Mailcode 01-127-0901
Cleveland, Ohio 44114-1306
Fax number (216) 689-3011
Attention: I. Smith
Equal Opportunity Employer M/F/V/D

KEY CORP®

SYSTEMS ANALYST. Two full time positions open (M-F, 40 hrs per wk.) To work for software consulting firm located in Beaverton, Oregon. Position Objective: Responsible for system analysis of IEF system in a DB2 environment throughout the full life cycle of project. Position Duties: 1) Formulation and analysis of client's business procedures as well as system's definition, scope and objective. 2) Analysis of existing system's information processing methodologies and preparation of detailed system's specifications as well as user's needs, and programs' functions to be incorporated in new system. 3) Execution of model management, BAA and BSD functions to be built using PC construction. 4) Provides consultancy to analyst programmers and programmer analysts on resolutions of complex problems including verification of their assigned projects to insure effective integration of their assigned work into system. 5) Provides leadership in connection with system construction, testing and commissioning. 6) Periodically confers with project manager on progress of system design and development and problems which may affect the system's budget and delivery target. Must have a BS in computer science, or an associate degree in computer science and 2 yrs exper. as a systems analyst, or 3 yrs of college in computer science and 1 yr exper. as a systems analyst. Must have 4 yrs exper. in job offered or related occup. of systems analyst. In addition to or concurrently with, must have 1) Completed or must have been responsible for the completion of 3 full life cycle projects (BAA and BSD) in a DB2 environment. 2) Project models must have admin. of 25 entities each. 3) One of three projects must have been built using PC construction. 4) All qualif. exper. must have been in IEF. Willing to relocate (1 yr. 100% out of state). Willing to travel (average trip 1 wk; 50% out of state). Salary: $61,008. Applicant must have legal authority to work permanently in U.S. Send resume to Oregon Employment Department, Attn: Job Order Number 8550761, 875 Union Street N.E., Salem, Oregon 97311. AN EQUAL OPPORTUNITY EMPLOYER

WORLD WIDE CONSULTING OPPORTUNITIES

AUSTRALIA • NEW ZEALAND • BRITAIN & EUROPE
U.S.A. • SOUTH AMERICA • SOUTH AFRICA

With offices throughout the world, we are a leading supplier of consulting personnel to an established international client base. If you are considering a career move in the near future, send us an up to date resume now and discover the opportunities we can offer you to expand your personal horizons.

WE URGENTLY NEED PEOPLE WITH THE FOLLOWING SKILLS:

❑ SYNON	❑ HOGAN
❑ IEF	❑ ORACLE
❑ SYBASE	❑ DB2 / COBOL
❑ SAP	❑ PROGRESS

COMPUTER CONSULTANTS INTERNATIONAL
700 Larkspur Landing Circle, #125, Larkspur, CA 94939
Phone: (415) 461-8989 Fax: (415) 461-4601

CONSULTING & FULL TIME POSITIONS

DICE is a FREE online job search service, providing detailed information about current contract and full-time positions across the USA. Use your computer and modem to access the latest job openings. It's a confidential, easy to use, no cost way to search for a new job.

D ATA PROCESSING
I NDEPENDENT
C ONSULTANT'S
E XCHANGE

ONLINE Number: 515-280-3423

Contact DICE via 1200/14400 baud Modem 8-N-1
A service of D&L Online, Inc.
515-280-1144

CAREERS IN COMPUTERS

$40,000 TO $65,000

IBM, AS/400, HP, COBOL, CICS, RPG/400, C, IMS DB/DC, NATURAL/ADABAS, SMALLTALK, POWERBUILDER, UNIX, SYBASE, ORACLE, DB2, GUPTA, C++, WINDOWS SDK, NOVELL INFORMIX, OS/2 DATABASE MANAGER

FOR THESE AND OTHER POSITIONS CALL COLLECT OR WRITE
(502) 589-3100
1800 Meidinger Tower
Louisville, KY 40202
COMPUTER CAREER CONSULTANTS INC.
350 AFFILIATED OFFICES
Client Companies Pay Fees

"First When Quality Counts"

Applications Developers

SALT LAKE CITY, UTAH

American Stores Company is one of the nation's largest retail grocery chains. The migration of our Systems Development Center to Salt Lake City has created many career opportunities for qualified individuals with 2-3 years' experience (retail desired) in the following areas:

POS Development Manager

Development and maintenance across three (3) platforms. Requires 10 years' POS Development experience and proven leadership skills. Retail/Grocery experience a plus.

Applications Programmers/ Junior Programmers

COBOL/COBOL II, MVS, CICS, DB2/SQL, IMS DB/DC, DB2/UNIX combination, VSAM, PL/1 a plus.

Business Analysts

Structured Analysis & Design, On-Line M/F, Client/Server, DB2/UNIX combination.

DBAs/Application Tools Specialist

IMS DB/DC, DB2/SQL, CICS, QMF, or Teradata; Data Administration, Development Tools.

Store Systems Application Developers

ICL/Datachecker; 4690/Basic, ADCS, NDM, NCCF.

American Stores offers attractive compensation, relocation, and benefits package. To apply, please send/FAX resume & salary requirements with a cover letter detailing your knowledge and experience to: American Stores Company, Attn: Job# 0001-CW, P.O. Box 309, Pleasanton, CA 94566-0309. Fax: (510) 833-8497. EOE.

AMERICAN STORES COMPANY

Southwest High Tech

Careers ON-LINE

COMPUTERWORLD

with your computer & modem:

800-252-4820 TX*

*outside TX: 508-875-2829

This service is available at no charge to job seekers. (Callers outside of Texas incur the cost of their telephone call.)

Every week Computerworld delivers more qualified job candidates than any other newspaper.

That's why more companies place more recruitment advertising in Computerworld than in any other specialized business newspaper.

Weekly. Regional. National. And it works.

An IDG Communications Newspaper

Available AUGUST 1ST for resume posting & job seeking!

Now you can access an online job database of technical careers in the SOUTHWEST!

Southwest High Tech

Careers ON-LINE

COMPUTERWORLD

enter your computer & modem:

800-252-4820 In TX*

*outside TX: 508-875-2829

This service is available at no charge to job seekers. (Callers outside of Texas incur the cost of their telephone call.)

Come Grow with Us

PRO-STAR, a division of PRODATA, Inc., is expanding its client/server consulting and applications development staff in Sacramento CA. We currently have openings for project leaders, system architects, analysts and programmers in our client/server practice. We are looking for development professionals with experience* or the following areas:

- Oracle version 7
- Oracle tools (e.g. PL/SQL, Forms, Reportwriter)
- Oracle Financials
- Object Oriented Analysis and Design
- Smalltalk-based development tools (e.g. ENFIN, Visual Works, Smalltalk/V)
- Powerbuilder
- Gupta development tools (e.g. SQL Windows, SQL Base)

PRODATA is an information systems consulting company with a substantial presence in the Western United States. We are fast growing and provide services that support all phases of the systems development life cycle. If you are a dedicated, hard working systems development professional, PRO-STAR is the career advancement opportunity for you! Please mail or fax your resume to:

PRO-STAR
6929 Sunrise Blvd., #210, Citrus Heights, CA 95610
(916) 969-0176 • FAX (916) 722-1045

150 OPENINGS

ARIZONA (36 positions - Apps Dev)
• CICS/VSAM • CICS/DB2 • MODEL 204
• Banking P/A's - DDA, TDA, CPCS (Pkgs o.k.)

OREGON (54 positions - Apps Dev)
• CICS/VSAM • CICS/DB2 • IDMS/ADSO
• PROGRESS • IEF Construction • AS/400 SYNON+
• Banking P/A's - ACH, LOANS, ARP (Pkgs o.k.)

COLORADO (60 positions - Sys Prog)
• MVS or VM • DBA's • Auto Opps
• UNIX Sys Adm • DB2 or IMS • CICS or VTAM

DATRONICS - Western Region Recruitment Center
151 Kalmus•Ste C-200•Costa Mesa•CA•92626-5963
Phone 714-751-3262 Fax 714-751-3902

Looking for qualified computer professionals?

Look no further. More than over one half million computer professionals read *Computerworld* every week. And you can reach all of them -- or just the ones in your region --with a regional or national recruitment advertisement in *Computerworld's Computer Careers* section.

For more information, call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700); or call your local sales office listed below:

BOSTON
Nancy Percival
375 Cochituate Road, Box 9171,
Framingham, MA 01701-9171, 508-879-0700

NEW YORK
Marty Finn
Mack Center 1, 365 West Passaic St.,
Rochelle Park, NJ 07662, 201-587-0090

WASHINGTON, D.C.
Katie Kress
8304 Professional Hill Drive,
Fairfax, VA 22031, 703-573-4115

CHICAGO
Patricia Powers
1011 E Touhy, Suite 550,
Des Plaines, IL 60018, 708-827-4433

LOS ANGELES
Barbara Murphy
2171 Campus Drive, Suite 100,
Irvine, CA, 92715, 714-250-0164

Manager Systems Software Development Center

AT&T Global Information Solutions, an industry leader building on the success and reputation of NCR and a major operation of AT&T, offers high visibility and responsibility for a $7 million budget and 60-70 systems employees in this key managerial position.

Working with SVR4 MP-RAS and Windows NT in our System 3000 environment, you'll guide the realization and delivery of these strategic operating systems, with emphasis on Price/Performance and innovations in Reliability, Availability, and Serviceability (RAS). The scope of our projects will make the most of your expertise in overseeing these areas:

- **Delivery and value-add to the Windows NT Advanced Server operating environment;**
- **Development and enhancement of the SVR4 MP Kernel, file systems, (local and remote) and utility subsystems, and ensuring that the operating system adheres to standards such as those driven by X/OPEN;**
- **Development and enhancement of advanced SCSI driver technology;**
- **Core administrative functionality and in-service enablers for improved system RAS, e.g., on-line system installation and updating, enhanced power fail recovery, etc;**
- **Design, coding, testing and debugging of numerous feature enhancements in these areas, as well as driving continuous quality and process improvement in the core operating environment.**

To meet this level of challenge, you'll need an engineering or computer science degree (masters preferred) and a comprehensive background in software development and operating systems. Demonstrated managerial, leadership and decision-making skills are also essential.

We offer an outstanding compensation package and a supportive environment that encourages continued professional development. For immediate consideration, forward your resume with salary history to.

Julie J. Godshall
Human Resources Dept., CW-81
AT&T Global Information Solutions
3325 Platt Springs Road
West Columbia, SC 29170

As an equal opportunity employer, we value diversity

AT&T Global Information Solutions

Open, Cooperative Computing
The Strategy for Managing Change.

★ GET OUT ★ OF TOWN

NATIONWIDE OPPORTUNITIES

YOUR HOME TOWN MAY HAVE MANY JOBS BUT NOT YOUR CAUSE! OPPORTUNITY THE COMPUTER-TECH NETWORK OF 100 NATIONAL COMPUTER SEARCH AGENCIES SPECIALIZES IN THE NO CHARGE PLACEMENT AND EMPLOYER PAID RELOCATION OF COMPUTER PERSONNEL TO ALL AREAS OF THE U.S.A. & OVERSEAS. TOLL FREE 1-800-735-3474 FAX (214) 385-9994

COMPUTER TECH NETWORK

2300 Gravel Rd., Rd
Fort Worth, Texas 76118

IMS PROFESSIONALS

Numerous openings on our staff in Columbus, Ohio for Programmer/Analysts and Senior Programmer/Analysts. Required: 4 years COBOL, 3 years TSO/SPF, 2 years Systems Analysis, 2 years IMS/COBOL, 1 year IMS DB/DC. Opportunity to learn DB2 & client/server. Complete compensation and benefits package includes medical, dental, 401(k), relocation assistance and much more. Please call, mail or FAX resume to: ELITE SOFTWARE & SERVICES CORP., 855 S. SUNBURY RD., WESTERVILLE, OH 43081 (614) 794-3777, FAX (614) 895-1993

VAX DATA CENTER MANAGER

Fortune 500 firm is consolidating several VAX sites into a central cluster site. The company is seeking a data center manager with experience managing a large cluster environment providing 24 hour, 7 day a week service to local & remote locations.

The successful candidate will be degreed, conversant with current DEC technology and have successfully managed a VAX data center involved in a major hardware/software consolidation effort. Our client is prepared to fill this critical need NOW and offers a highly competitive salary and relocation package!

SOFTWARE PRODUCT DEVELOPERS & MANAGERS

Our clients have several openings for managers, product developers and product support professionals. These positions are with vendors of IBM mainframe system software products and require coding experience in assembler and knowledge of DB2 or IMS or CICS or VTAM/NCP.

PROGRAMMER/ANALYSTS

The economy is improving and so is the market for experienced Programmer/Analysts. Our clients across the country have immediate needs for P/A's with AS400 RPG ® or IBM Cobol with CICS or DB2 or IMS. Banking or Life Insurance a BIG plus.

We have 300 affiliated offices throughout the U.S. and Canada to assist in your search.

ROBERT SHIELDS & ASSOCIATES

Robert Shields & Associates
P.O. Box 890723
Houston, TX 77289-0723
713/486-7961 • FAX 486-1496

great EXPECTATIONS

Multimedia promises the world, but some users may find it hard to attain the glitz they're hoping for

By Stephanie Wilkinson

MULTIMEDIA, the fluid integration of text, graphics, animation, sound and video, is swiftly grabbing the corporate imagination. As a result, expectations are running high — too high, some experts say.

No longer limited to animated games, multimedia's use ranges from enhancing presentations and training to developing point-of-sale kiosks and retail CD-ROM titles.

Thanks to sophisticated authoring tools, multimedia capabilities are now within reach of those with limited programming know-how, but high expectations often result in frustration. "The vendors tend to claim that anyone can use their products," says Don Caskey, vice president of development at Synesis Corp., a training development company in Roswell, Ga. "These days people want to imitate the kind of multimedia seen on TV. They don't realize that it's not that easy."

Let the buyer beware

While authoring tools are getting better all the time, Caskey says, buyers should know what they're getting into. "People underestimate the time it takes to do multimedia, both to learn the product and to produce the end result," he says. "They may also be surprised by the tinges of amateurism that appear in the final product."

Veteran tool users advise newcomers to avoid rushing through the tool selection process. For example, Jim Rounsaville, a senior training specialist at Beckmann Instruments, Inc. in Brea, Calif., took two years to choose a tool he was comfortable with. "I took classes and read industry literature. I had to find a product that would be accessible to me — one that wouldn't make me write a lot of code," Rounsaville says.

Moreover, users shouldn't expect to quickly churn out great-looking materials all at once. "From inception to completion, a one-hour multimedia training program takes about 100 hours to do," says John Patten, LAN manager at a major Midwest auto manufacturer.

Individual differences

Each tool has its own metaphor, or way of allowing users to organize the various media forms that go into a multimedia program. Some systems use a time line, others use a storyboard or film strip metaphor, and still others use icons or flowcharts. The variety of metaphors available make careful shopping crucial. "If you jump into a metaphor that doesn't accommodate the way you think or work, you could suffer," says Gary Schultz, principal analyst at Multimedia Research Group in Sunnyvale, Calif.

Of course, the more glitz you want, the better tool you'll need (see CW Guide, page 67). At the low end, the tools create multimedia presentations that proceed in a linear fashion without much backtracking or skipping ahead. High-end tools allow authors to build interactivity into the final product. Touch-screen support, robust networking links and integrated database functions are key.

Vendor training

Users must not underestimate the learning curve. "It's substantial," says Dan Spirn, author of CD-ROM games for children at GTE Interactive Media in Carlsbad, Calif. "You have to play around with it a lot to get good at it."

Spirn and other users strongly recommend on-site training, which some vendors offer to get going on their products. On-line tutorials and traditional manuals also help, although hands-on training is best. "I'm just not sure how well you could learn an authoring system from the books," says Kristin Stone, systems trainer at Mass Mutual Life Insurance in Springfield, Mass.

For optimum results, you may want to consider building a team of multimedia specialists. "You can do it all on your own, but you might have to live with a pretty amateurish piece," says Mark Reed, network administrator at Hoffman-Laroche, a pharmaceutical manufacturer in Nutley, N.J.

But whatever the approach, temper expectations to meet the project, Schultz advises, and think carefully about the desired product, whether it's a simple audio-and-text slide show or a full-blown interactive program with digital sound and video. "Find out what suits you," Schultz says. ■

Wilkinson is a free-lance writer in Charlottesville, Va.

multimedia facts

Where's it being used?

	1993	1996*
EDUCATION AND TRAINING	46%	66%
PRESENTATION PACKAGES	42%	65%
MULTIMEDIA PUBLICATIONS/ REFERENCE MATERIALS	35%	76%
MULTIMEDIA DATABASES	26%	74%

*Estimated

What's being spent?

The average multimedia budget for the next 12 months is $200,000. Here's how it will be allocated:

APPLICATIONS	34%
PLATFORM INFRASTRUCTURE	26%
DEVELOPMENT TOOLS	15%
NETWORK INFRASTRUCTURE	10%
SERVICE AND SUPPORT	10%
ADDITIONAL PERSONNEL	5%

Base: 305 corporate users

Source: Business Research Group, Newton, Mass.

Launch Date: S

Coming Soon...
Marketplace Information Center!

It's the unique, new service designed to help Computerworld Marketplace readers – key users and buyers of information technology – get important product/service information – fast.

Starting September 5, It Can Work – for You! Because...
...Every call gets answered immediately – you get no busy signals, unanswered calls, or answering machines.
...Every call generates immediate turnaround of the specific product/service information *you* request.
...Every call is free to you.
...And because the Marketplace Information Center is user friendly!

Look for the Toll-free Number – Then Give Us a Call. Trained Specialists Will Be Standing by...Waiting To Help YOU!

Data Compression

The world's most popular data compression comes to MVS!

PKZIP MVS

Stacking Frames

A vertical solution to a horizontal problem...

CSF-174 2HI
34" W x 22" D x 49" H

CSF-Mini 2HI
25½" W x 22" D x 49" H

CSF-174-3HI
34" W x 22" D x 70" H

CSF-Mini-3Hi
25½" W x 22" D x 70" H

Saves valuable floor space. Perfect for file servers or controllers. Adjustable shelves for complete versatility. Choose from a variety of options. Ready for immediate UPS shipment. Call now for more information.

DATA CONNECTIONS

Piedmont Centre P.O. Box 11168 High Point, NC 27265
910-854-2801 Fax 910-854-6211

1-800-225-1855

YOUR COMPLETE SOURCE FOR STACKING SOLUTIONS

Computer Presentations

Bright color. Bright price.

$2,299.

The BOXLIGHT 1280 ColorShow Special.

SPECIAL OFFER!

The BOXLIGHT 1280 True Color Projection Panel. At $300 off, it's an unbeatable value.

- Brightest image
- Compact & portable
- PC & Mac
- FREE remote & cable

- The projection panel specialists
- More than 50 models in stock
- Instant availability
- Overnight shipping
- 30-day guarantee
- Technical support hotline

BOXLIGHT: Your direct source for all the bright answers.

No one else offers the one-stop shopping...the selection... the value...the immediate delivery...and the knowledgeable service and support you get from the projection panel experts.

BOXLIGHT®

New for 94!

COMPUTERWORLD's

"5th Wave" Cartoon Mouse Pad

COMPUTERWORLD brings humor to a mouse pad featuring a new cartoon from "The 5th Wave" series by Rich Tennant. Not available in stores, this colorful foam-backed pad will keep your mouse clean and protect your desktop.

Best of all, it's only $7.99*. Send your name, address and check or money order to **COMPUTERWORLD**, P.O. Box 9171, Framingham, MA 01701, Attn: Product Fulfillment. For credit card orders, call 1-800-343-6474.

*In U.S., for each unit ordered, add $1.25 for postage and handling; orders outside U.S. add $2.50 each. Residents of MA, CA, GA, NJ, and DC add applicable sales tax. Canada residents add G.S.T.

Optical Disk Storage

The Last Disk Drive You'll Ever Need!

- Unlimited Capacities!
- Unlimited Uses!
- Less than 25¢ per MB
- Lifetime Warranty!*

Value Vendor

FAX (408) 437-6333

1-800-873-VALU

OPTICAL Offer!

230MB Optical Drive

Starting at only

$699.

Limited Time Offer! CALL NOW!

Buy / Sell / Lease

BUY • SELL • LEASE • RENT • NEW • USED • ALL BRANDS & MODELS

UNBEATABLE FOR UNIX & RISC!

ALPINE COMPUTER SALES

UNIX- & RISC-BASED WORKSTATIONS
- IBM RS/6000
- IBM RT - 6150
- HP 3000/9000
- SUN MICRO
- SGI
- DEC/VAX/ALPHA
- DATA GENERAL
- BULL
- ALL OTHERS

SYSTEM UPGRADES
- MEMORY
- CONTROLLER BOARDS
- DISK DRIVES
- GRAPHICS UPGRADES
- RAID SYSTEMS
- TAPE DRIVES
- PROCESSOR UPGRADES
- ADAPTERS OF ALL KINDS

ALL BRANDS & MODELS
- SYSTEMS
- FEATURES
- DISPLAYS
- TERMINALS
- RAID SYSTEMS
- MODEMS
- MASS STORAGE
- PRINTERS & PLOTTERS
- X-STATIONS
- CONNECTIVITY
- ALL PERIPHERALS

NETWORK BUY/SELL
- IBM
- ANDREW
- BLACK BOX
- CABLETRON
- CANOGA PERKINS
- CHIPCOM
- CISCO
- MADGE
- NETWORTH
- PROTEON
- SYNOPTICS
- WELLFLEET

☆ TOKEN RING & ETHERNET CARDS

702-782-5208
FAX: 702-782-5244

800-853-5208

Buy / Sell / Lease

IBM Systems • Peripherals • Parts & Service

NEW & USED IN STOCK

- RISC System/6000
- Workstations
- Parts & Features
- AS/400
- Novell Networking
- Sun & Dec
- Personal Computers
- Data Communications
- UPS Systems
- Peripherals & Upgrades
- System 36 Conversions
- AutoCad

Authorized Distributors for: Seagate • Xerox Kingston • Cal Comp Motorola • UDS/Codex Decision Data Products

8 Nationwide Locations

A Publicly Traded Company NASDAQ MKPL

Computer Marketplace prides itself on being your one-stop computer hardware solution

COMPUTER MARKETPLACE

800-858-1144

TEL (909) 735-2102 • FAX (909) 735-5717
1490 Railroad Street • Corona, CA 91720

CBE

Buy / Sell / Lease

SERVTEK COMPUTERS
"Where service meets technology"

New & Used

BUY ◆ SELL ◆ RENT ◆ LEASE

- Amdahl
- Data General
- Digital Equipment
- EMC
- Hewlett-Packard
- Hitachi
- IBM: *RS/6000 • AS/400 • Mainframe*
- Silicon Graphics
- Stratus
- Sun
- Tandem
- Unisys
- Wyse
- Xerox
- NCR
- Sequent
- and more

Call Today!

(800) 729-3280

SERVTEK COMPUTERS
180 Newport Center Drive, Suite 265
Newport Beach, CA 92660
(714) 729-3280 • (714) 729-3288 Fax

Large Systems Computers & Peripherals

IBM

- ES/9000
- SERIES/1
- AS/400
- RS/6000
- SYSTEM/88
- Point Of Sale
- ...and more!

New & Used

- *Computers*
- *Peripherals*
- *Upgrades*

Buy • Sell • Rent • Lease

amdahl
Cisco
Concurrent
Data General
digital
Hitachi
HEWLETT PACKARD
Memorex-Telex
Prime
Silicon Graphics
Stratus
Sun
TANDEM
TEXAS INSTRUMENTS
UNISYS
XEROX

SPECTRA
(800) 745-1233
(714) 970-7000 • (714) 970-7095 Fax

Anaheim Corporate Center
5101 E. La Palma Ave., Second Floor
Anaheim, CA 92807

Buy / Sell / Lease

RS 6000 Leader

Engineering • Buy • Sell • Rent • Parts • Repair

AS/400 9221

Call Now for your FREE Configurator!

NEW & USED

800-553-0592

DATA PRODUCTS

7400 Flying Cloud Drive • Eden Prairie • Minnesota • 55344 • USA • Fax 612 943 1131

Systems & Services

Dempsey: Where IBM® Quality Is Second Nature!

- RS/6000
- AS/400
- SERIES/1
- ES/9000
- PS/2 & VP

Sales & Rentals
- Processors
- Peripherals
- Upgrades

Dempsey BUSINESS SYSTEMS
18377 Beach Blvd., Suite 323 • Huntington Beach, CA 92648
(714) 847-8486 • FAX (714) 847-3149

IBM Authorized Distributor Products Integrator

Complete, Tested Equipment
Technical Assistance & Overnight Shipping!
(800) 888-2000

Outsourcing / Remote Computing

ALICOMP, INC.

The "Boutique" of the Computer Services World

Outsourcing Remote Computing

VM, MVS, VSE

Two State of the Art Locations:

ALICOMP / CBS

20,000 sq. ft. Manhattan complex 105,000 sq. ft. Secaucus, NJ complex

"Our Platform is Excellence"

Serving Clients Since 1980

(212) 886-3600 • (800) 274-5556

Time & Services

Most Vendors have well-equipped data centers...

They have large systems with the software you need, plenty of MIPS, and UPS systems.

ONLY ONE WILL EXCEED YOUR EXPECTATIONS!

- Only one runs your work as its own.
- Only one minimizes your risk and maximizes your cash flow.
- Only one will get the job done totally.

CSC CompuSource – dedicated to outsourcing since 1980.

YOU'RE IN CONTROL WHEN YOU PUT US IN CONTROL!

CSC

CSC CompuSource
A Unit of Computer Sciences Corporation

110 MacKenan Drive
Cary, North Carolina 27511
919.481.9341

Outsourcing

If Outsourcing is your objective...

You can maximize your information technology investment by outsourcing part – or all – of your IS operation. Whether it's a transitional or long-term total services partnership, American Software's the right place to rightsize.

Even software developers enjoy the cost and time-saving benefits of outsourcing with us. Call today and we'll tell you why.

® The Outsourcing Group
A Unit of American Software USA
470 E. Paces Ferry Road
Atlanta, GA 30305
404-264-5770

Get Instant Access to – Computerworld Introducing . . . . CW Online

Computerworld introduces CW Online, a comprehensive, fully searchable library of Computerworld articles. With CW Online, you can search the three most recent years of Computerworld issues. And the service is updated weekly, so you can access new information every week. Research has never been so easy, so complete or so economical. Right from your personal computer.

The Online start-up kit costs just $25.00 and includes everything you need to start using CW Online including easy-to-use communications software. After that, you'll be charged for access time along with a $5.00 monthly account service fee. You can even set your account up for us to bill your credit card or invoice your company on a monthly basis.

Call today to enter your subscription to CW Online and to receive your CW Online start-up kit with valuable communication software.

CW ONLINE Electronic access to a library of Computerworld articles

For more information or to order call
800-343-6474 x81-493 today.

Outsourcing / IT Management Consulting

Not sure if *OUTSOURCING* is for you?

TBI will help you determine how outsourcing can benefit your organization. We'll educate your team on the entire outsourcing process and objectively evaluate your business environment. TBI stays with you from start to finish. Our outsourcing specific methodologies, vendor evaluation models, and bid management techniques will help you keep control of the process. We offer full support for datacenter, application and network outsourcing needs. Call to learn how TBI's no-risk assistance can result in successful outsourcing.

Satisfying Fortune 500 clients nationwide for over 25 years!

TBI 800-676-9470

Technology & Business Integrators, Inc.

TBI TBI TBI

Outsourcing / Remote Computing

Your best choice for mainframe computing services

REMOTE COMPUTING

Extensive Software Library

Telenet Tymnet
Advantis Compuserve

MVS/ESA IMS/DBDC
VM/ESA CICS SAS
VSE/ESA TSO DB2

Extraordinary Customer Service
Migration Management

708-574-3636
New England 617-595-8000
815 Commerce Drive, Oak Brook, IL 60521

FANEUIL SYSTEMS

Computer Books

FEAR OF COMPUTERS

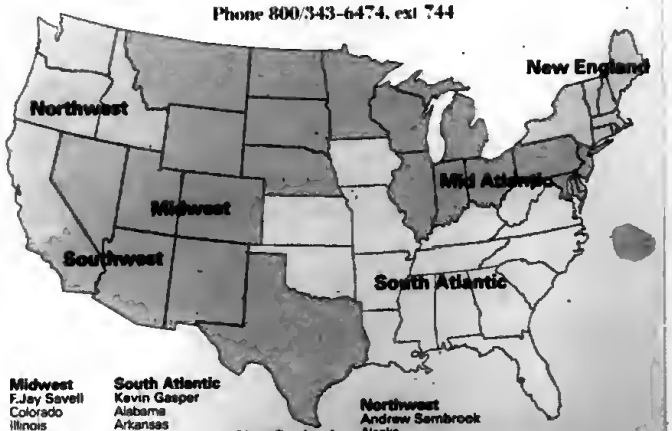
A funny NEW book by
MICHAEL COHN
high-tech humor columnist for
COMPUTERWORLD

Ask for it at your local book store or call Northwest Publishing, Inc. at (800) 398-2102

COMPUTERWORLD
Marketplace

Reach more buyers by stretching your ad budget with our charter rates! Your Computerworld Marketplace Account Executive has all the colorful details—call today

Phone 800/343-6474, ext 744



Midwest
F.Jay Savell
Colorado
Illinois
Minnesota
Montana
Nebraska
New Mexico
North Dakota
South Dakota
Texas
Utah
Wisconsin
Wyoming

Alberta
Manitoba
Saskatchewan

South Atlantic
Kevin Gasper
Alabama
Arkansas
Florida
Georgia
Iowa
Kansas
Kentucky
Louisiana
Mississippi
Missouri
North Carolina
Oklahoma
South Caroline
Tennessee
Virginia
West Virginia

New England
Susan Cardoza
Connecticut
Maine
Massachusetts
New Hampshire
New York
Rhode Island
Vermont

New Brunswick
Newfoundland
Ontario
Quebec

Northwest
Andrew Sembrook
Alaska
Idaho
Northern California
Oregon
Washington

British Columbia

Southwest
Claude Garbarine
Arizona
Hawaii
Nevada
Southern California

Mid Atlantic
Michelle Reeves
Delaware
Indiana
Maryland
Michigan
New Jersey
New York City
Long Island
Ohio
Pennsylvania
Washington D.C.

Bids & Proposals

MS CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by CDPA, 301 N. Lamar St., 301 Bldg. Suite 508, Jackson, MS 39201 for the following: **RFP 2833** due Thursday, August 25, 1994 @ 3:30 P.M. for the acquisition of Graphical User Interface Builder software for the Mississippi State Tax Commission. No Charge.

RFP 2834 due Wednesday, August 24, 1994 @ 3:30 P.M. for the acquisition of packaged microcomputer-based adult basic literacy and workplace literacy educational systems for the Mississippi State Department of Human Services, Department of Jobs, Opportunities and Basic Skills (JOBS). No Charge.

Vendors may request RFPs with no charge by calling Linda Watkins at (601)359-2604. CDPA reserves the right to reject and/all bids and to waive informalities.

Services

PABTECH
Offers Services in India

- Setting up new Company
- Representation
- Software Development
- Provide experienced Computer Professionals
- Desk Top Publishing
- Preparing Database
- Mass Mailing

PabTech Systems
India (P) Ltd.
N-140,G.K.I.
New Delhi-110 048, India
Tel: 91-11-644-3740
Fax: 647-4917/647-4646

Timely Editorial Leads Readers to the Section and Buyers to Your Ad Every Week!

Aug. 8:
Alternative Buying Channels for Corporate Environments: Are Channels Like Mail Order and Superstores Viable Options?

Aug. 15:
Networking Product Purchasing: How Much Freedom Does Corporate IS Afford Remote Offices?

COMPUTERWORLD
Marketplace
1-800-343-6474, ext.744

Think the PC Newsweeklies Are the Best Vehicles for Your PC Advertising?

THINK AGAIN.

Readership Coverage among IS Managers*	
Computerworld	**36.5%**
InfoWorld	34.5%
PC Week	33.8%
Involved in the Purchase of PC Hardware	
Computerworld	**36.4%**
InfoWorld	35.6%
PC Week	34.9%
Involved in the Purchase of PC Software	
Computerworld	**37.1%**
InfoWorld	35.6%
PC Week	34.9%

* All - CIO/VP/Dir/Mgr IS/MIS, Corp/Dept MIS

Source: Simmons CompPro II Study, May 1994.

COMPUTERWORLD
Marketplace
1-800-343-6474, ext.744

Looking for...

...Application development tools from an experienced developer?

The AD Toolbox has just what you're looking for ...flexible, portable, and maintainable tools for your environment/platform. Simply locate the developers providing your solutions - and give them a call.

And, if you're a developer with solutions to sell, call 800/343-6474, ext 744
Then watch the AD Toolbox go to work - for you!

APPLICATION DEVELOPER'S TOOLBOX

WINDOWS COBOL TOOLS

COBOL for the 21st Century

Modernize your COBOL applications and take advantage of the most sophisticated enhancements to COBOL development, including:

- Graphical User Interfaces (Windows and Windows NT)
- Fast compile times — fastest among leading COBOLs
- Portability across over 600 platforms
- Fully integrated development tools

Take your organization into the 21st century. Call Acucobol today at 800-COBOL-85 or 619-689-7220. Or fax us at 619-689-7251.

acucobol inc

MS-DOS

Royalty-Free DOS Extender!

Plus a Windows linker and DOS dynamic overlay linker, all in one product for the same price!

Why use a multitude of programming tools when one will do? BLINKER 3.0 features a fully-functional DOS extender to directly access up to 16Mb of extended memory, the world's fastest Windows linker and the fastest dynamic overlay linker to automatically design and manage overlays within 640KB. You can even create a single *dual mode* program to automatically run in either protected mode or real mode, depending on the runtime machine's resources. Compatible with C, C++, CA-Clipper, FORTRAN, Assembler, etc. BLINKER saves hours of valuable programming time.

- No risk, 30 day money-back guarantee
Order BLINKER 3.0 today for only $299
FREE DEMO disk available on request. Blinkinc
Call Now 804-747-6700 Or FAX to 804-747-4290

WINDOWS IMAGING

BASIC
SCANNING OCR
DISPLAY
IMAGEFORMS
VISUAL PROGRAMMING
• Lotus Notes®
...of the Year
...your imaging system
...ing capabilities
...ponents are in use by over 100,000 users
...guarantee eliminates risk of trying product
...HEAD SOFTWARE, INC.
...TOOLS Fax: (808) 545-7042

WINDOWS

SixBase/VB

Makes Windows F-A-S-T!

How Fast? Well, how about 40 TIMES faster than other Windows data-engines. That's SPEED! Add that to SixBase's multi-user database support (including Fox/IDX-FPT & Clipper/NTX-DBT) Encryption, Query-optimization and our Very NOT Brouse/Grid and Data-aware VBX controls and you've got the most action-packed Windows database engine around.

Now Only $149
(30 Day Money-back Guarantee)

(800) 683-1657
(909) 699-9657
FAX (909) 695-5679

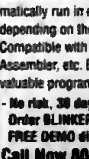
SuccessWare Int'l.

PROGRAMMING HURDLES Getting You Down?

You've Turned to the Right Place!

Because...every week, you'll find the right tools for the right jobs – right here. In the new Application Developer's Toolbox in Computerworld Marketplace.

NEWSLETTERS



Each month industry guru, Ed Yourdon brings you 6 fast-reading pages of objective, authoritative advice on the tools, languages, technologies, and information sources you need to survive and succeed as a software professional.

APPLICATION DEVELOPMENT STRATEGIES

Assessing, selecting, and implementing application development tools and methodologies? Cut through the marketing hype with the help of Ed Yourdon's monthly newsletter for managers **Application Development Strategies**

AMERICAN PROGRAMMER

Described as "the *Harvard Business Review* of the software field," Ed Yourdon's **American Programmer** provides Managers with the insights of industry leaders on peopleware, OB, reengineering, C/S, software quality, productivity, and more.

For FREE sample(s) contact:
Cutter Information Corp.
Attention: Samples Manager
Fax: (800) 888-1816 Call: (617) 648-8700
Email: 74107.853@compuserve.com

OBJECT ORIENTED

Learn C++ & Windows-Based Programming... *Simply, Quickly!*

With the OML Learning Series™ you can learn C, Visual C++™, object technology and Windows™-Based programming quickly and conveniently in the privacy of your home or office. The OML Learning Series features:

Visual Series™, C/C++ Series™
OOA/OOD Series™, OLE Series™

Each series: $245* (reg. $400)
Any 2 series: $395* (reg. $700)
Any 3 series: $545* (reg. $1000)
All 4 series: $645* (reg. $1300)
LAN version: Call
* Limited Time Offer

MONEY BACK 30 DAY GUARANTEE

Call us for information and FREE Demo Software.

800-6789-OML

Ask about our low cost LAN package.

OBJECT MANAGEMENT LABORATORY
TEL 818-879-9620
FAX 818-879-1850

OML LEARNING SERIES
Object Technology Made Simple

POWERBUILDER TOOLS

ObjectStart from Greenbrier & Russel Software can make you a more profitable developer. With a comprehensive class library containing over 100 reusable objects, including GUI controls and security objects. This tool let you build MDI applications at lightning-quick speeds. It frees you to think about the functionality of your applications (the fun stuff) not how to make them run (the boring stuff).

With ObjectStart, each application will have consistent development structure. This prevents the standardization of all applications and simplifies maintenance and documentation. ObjectStart even comes with an application generator that builds a working MDI application.

Created by Greenbrier & Russel, recognized leaders with client/server technology, ObjectStart is a complete PowerBuilder Object Tool Kit that turns an ordinary techno-gamer into a supercharged techno-gamer.

Any questions?
Managers: Call for a free cost / benefit analysis.
Techno-gamers: Just ask for the free demo disk package.
800-453-5347 ext 301

ObjectStart
Frank Greenbrier & Russel, Inc.

POWERBUILDER

PowerBuilder™
Business Data Workbench
for Sales and Marketing Automation

...based on pre-tested ...which can be extended into ...

Complete definition and control of system functionality and status data - on your own distribution lines

Advanced interface approach simplifies navigation of complex data - includes GUI, a unique, "history driven drag-and-drop" facility which automatically adapts to database changes

Includes EPIsoft™ application data ... major SQL database platforms (also ... reverse engineering)

Complete system level base class and "application" level base class for sales and marketing

MS- DOS

Lahey
FORTRAN
New! 32-Bit Fortran 90
FORTRAN 77 Professional and Student Versions
New Code or Downsizing
Complete Suite of Tools
Free Technical Support
A Decade of PC Fortrans
(800) 548-4778 or (702) 831-2500
Fax: (702) 831-6123

SECURITY

Protect Your Software and Revenues

Stop piracy - Increase revenues. Sentinel® is the world's leading software protection solution. Call today for your Sentinel Developer's Kit

Sentinel 800-852-8569
Securing the future of software
Rainbow Technologies, Inc. fax 714-454-0557

Application Development...

Critical software technologies, including products that enhance the development of mission - critical client/server applications, are of primary interest to IS professionals. With today's focus on maximizing productivity, these professionals - Computerworld readers - are looking for proven application development tools. Fast sophisticated tools for designing, developing, and implementing complex applications for today's diverse environments.

Application Development...

Critical software technologies, including products that enhance the development of mission - critical client/server applications, are of primary interest to IS professionals. With today's focus on maximizing productivity, these professionals - Computerworld readers - are looking for proven application development tools. Fast sophisticated tools for designing, developing, and implementing complex applications for today's diverse environments.

Solutions Directory

401(k) ADMINISTRATION

DELTA DATA SERVICES, INC. . . . . . .
(800) 481-6186
Defined contribution administration software for the plan sponsor. Interfaces with payroll for administration of 401K, ESOP, thrift, and profit sharing plans. Daily or periodic processing, distributions, loans, ADP/ACP testing, user defined statements, voice response. Runs on AS/400. Client/server version available mid-1994.

ACQUISITIONS - PUBLIC CO.

Looks to acquire contract programming companies. Call confidentially . . . . . (516) 437-3302

APPLICATIONS CONVERSION

MIGRATION - CONSOLIDATION
SERVICES:
VSE to MVS Migrations/MVS Re-Design
Data Center Consolidations
DFSMS Migrations
Project Management
COBOL/VS to COBOL/370 Conversions
Systems Integration & Re-Design, Inc.
(804) 684-2283

APPLICATIONS DEVELOPMENT

APPLICATION DEVELOPER'S TOOLBOX
See preceeding page in Marketplace.

AS-400/CICS/UNIX/Client-Server applications
AMPERSAND CORP. . . . . . **(818) 849-6100**

Is your shop ready for the "Turn of the Century"?
. . . . . **(800) 989-9757**

RESOURCE SOLUTIONS (800) 825-8864
CASEBASE V.4, PC guide to 600+ products from 250 vendors, makes software development tool selection a snap. Instant access to individual or comparative reports. $195 (1yr) or $285 (2yr). 6050 Peachtree Parkway, Suite 340-228, Norcross, GA 30092

Micro Focus COBOL/CICS/IDS/DB2
SilverStone Systems, Inc. NY . . . **(212) 799-4079**

C++

C++ Training, Design, Emergency Code Repairs.
Rowe Technology . . . . . (206) 869-7693

CABLING SERVICES

Hi-Speed Printer Cables 30ft-200ft
Autotime Corp. . . . . (503) 452-8577

CLIENT SERVER DEVELOPERS

High performance OLTP design and implementation specialists. We utilize memory resident databases, Sybase, SQL Server and Oracle, as appropriate on Windows NTAS, Stratus/VOS/FTX and UNIX Servers with either Windows or Unix Clients.
Developers Edge Ltd. 1-800-EDGE-SYS

Innovation Technologies, Inc.
(PowerBuilder Specialists) (313) 591-7472
Quality Client Server GUI Applications. Development/Testing using formal methodologies: OOA, OOD, OOP, Integration Testing, System Testing, Acceptance Testing, PowerBuilder, C/C++, Auto Testing, Oracle, Informix, Sybase, Ingres.

NIIT - Software Division . . . . **(404) 804-6446**
Developers of client server applications using Sybase and Oracle. Option for offshore software development available. For more information, contact us at 400 Perimeter Center Terrace, Suite 900, Atlanta, GA 30346. Fax: (404) 804-6445.

PowerCorv (PowerBuilder Specialists)
Tampa, FL (8 branch offices) . . . **(813) 226-2378**

CONSULTANTS

FREE Technical Help on Oracle
DBA, SQL, Embedded SQL, Cobol under UNIX or MPE/IX. We may answer your short tech. question right on phone. Call 703-448-8464 Mon, Wed & Fri 6:30 to 8 PM EST. Better Fax 703-448-5639 (any time) before calling. Limited time offer.

CONTRACT PROGRAMMING

For your every computing need... We are a storehouse of talent in ORACLE 7.0, SYBASE, POWERBUILDER, UNIFACE, IBM (CICS, DB2, VSAM, COBOL), UNIX, WINDOWS, C, C++.
Call us at **(800) 951-6198.**
Hasseware Technologies, Inc.

NASTEL Technologies
Prime source for cost effective, high quality, on-site/offsite software development. Expertise in Oracle, Informix, Sybase, Powerbuilder, Client Server applications, re-engineering (multimedia, windows) and CAD conversions. Reliable delivery. Excellent References.
(212) 251-0787 Fax 212-980-4980

AS/400, RPG/400, B2K, PRISM, CUSTOM APPS
Skyline Designs, Inc . . . . . **(503) 362-4788**

DATA WAREHOUSING

UNLOCKING THE POWER OF INFORMATION
Solvera Inc. . . . . (800) 999-4829

DISASTER RECOVERY

CHI/COR Information Management, Inc.
(312) 322-0150
Recovery Planning Made Easy. PC software tools guide network, data center and business unit planning. Includes complete methodology to teach novices recovery planning concepts and relational database for easy planning. MS-Windows and LAN compatible.

CHI/COR Information Management, Inc.
Recovery Planning Software . . . **(800) 448-8777**

EDUCATION & TRAINING

Object-Oriented Analysis & Design Training
aLigra Systems . . . . . **(800) 347-8803**

James Martin World Seminar
(312) 346-7000
Business Process Redesign and Enterprise Engineering in computer industry's most valuable seminar. Three days with Dr. James Martin that will change your professional life. Also, Software Reuse Engineering and Client/Server tutorials. Call for seminar dates and prices.

NIIT - Training Division . . . . . **(404) 804-6446**
Developers of custom Computer Based Training (CBT), Multimedia, and Performance Support Systems. Development site is ISO-9001 certified. For more information, contact us at 400 Perimeter Center Terrace, Suite 900, Atlanta, GA 30346. Fax (404) 804-6445

VISUAL BASIC Training
Texas Software Svcs. . . . . (214) 404-1055

EASY TECHNICAL UPDATING
50-Minute videos, $29.95 each, on today's crucial topics (client/server, OOPS, software engineering, networking, AI) by over 40 leaders (Stroustrup, Bell, Knuth, Microsoft, etc.) CONTACT UVC, toll-free 1-800-600-1510 x1112; uvc.lemon@forsythe.stanford.edu. FREE CATALOG. SATISFACTION GUARANTEED

ELECT. DATA INTERCHANGE

EDI software, consulting, & integration
Next EDition, Inc., 14+ yrs exp . . . . (216) 498-0602

FAX-ON-DEMAND

COMPUTER-FAX INTEGRATION
Discover the Power of Fax-On-Demand. Increase Sales. Save 90% over past method. Delivery product literature upon request 24 hrs/day, 7 days/wk. Buy Fax-On-Demand Marketing Tool for the 90's to learn how. For more, call 408-243-2275, get Doc #210.
AllConsultants 1-(800) 982-3718

GROUPWARE LOTUS NOTES

Nationwide Professional Services
Summit Software Services, Inc. . . . (503) 226-8250

HELP DESK

PowerCorv (PowerBuilder Application)
Tampa, FL . . . . . **(813) 226-2378**

I/T CONSULTING

ITM, Inc. (617) 489-3630
Focus: *Development Productivity, Data Management, Strategic Planning, Staff Augmentation*, Custom, business aligned methodologies (w/integ. Bus. Proc. Re-Eng. & Data Mgmt), Impl. Coaching, Meth. Educ.; CASE GUI PowerBuilder (Dev. & Proj. Mgrs.); Info Modelers, etc. Data Warehousing & Admin., I/T Planning, Arch Des
We help you use I/T to create Business Value through Organizational Success.

MCBA

SYSTEMS DESIGN & SERVICES, INC. - (708) 894-1674 Specializing in support, enhancements, upgrades, conversions. Established 1982. ALL applications, releases, versions, languages, operating systems. NEW! UNIX/AIX, AS/400 SOFTWARE FOR: ACCOUNTING, DISTRIBUTION, MANUFACTURING, HUMAN RESOURCES, 4GL

MANUFACTURING SOFTWARE

PowerCorv (PowerBuilder/Sybase Application)
Tampa, FL . . . . . **(813) 226-2378**

MARKETING INFO. SYSTEMS

PowerCorv (PowerBuilder Application)
Tampa, FL . . . . . **(813) 226-2378**

MEMORY

MEMORY CONVERSIONS DIP/SIP 30/72 SIMM
Autotime Corp (503) 452-8577

OBJECT CLASS LIBRARY

MetaSolv Software, Inc.
(Powersoft CODE Partner) . **(214) 238-0823 x104**

PowerCorv (PowerBuilder Object Library)
Tampa, FL . . . . . **(813) 226-2378**

OFFSHORE SOFTWARE DEV.

***U.S. *Taiwan *China**
Mainframe/Mini or Client-Server. New development, conversion, or testing. U.S. location or the largest software factories in Taiwan & China. DBMS Specialists. Cobol, C/C++, Powerbuilder, etc. Satellite links optional. Superior quality at great prices.
Chen & Associates, Inc. . . . . . **(800) 448-2436**

We are organized to deliver... ORACLE, SYBASE, POWERBUILDER, UNIFACE, IBM/UNIX solutions. State-of-the-art software factory. Project references on request.
Call us at **(800) 951-6198.**
Hasseware Technologies, Inc.
Princeton • Bahrain • Denmark • Bombay

OFF-SITE SOFTWARE DEV.

AS-400/CICS/UNIX/Client-Server applications
AMPERSAND CORP. . . . . . **(818) 849-6100**

Powerbuilder/ORACLE/SYBASE/etc. - C/S Applications PowerSource, Inc. . . . . **(800) 229-2584**

OUTSOURCING

ALICOMP and CBS Data Services formed a business alliance to offer the highest level of technical, operational, and managerial expertise within a single mandate: loyalty and the highest quality computer services with flexible pricing.
ALICOMP/CBS
(800) 274-5556
(See Our Ad in the MarketPlace)

IBM MVS/ESA TIMESHARING
CICS DB2 IMS
Current IBM software releases. Specializing in outsourcing for software developers.
BOOLE & BABBAGE
COMPUTER SERVICES
(800) 22-BOOLE

OUTSOURCING/REMOTE COMPUTING
For 26 years we have nationally located outsourcing services on all platforms from over 2,000 data centers. **NEVER** a fee to our buyers because we are paid by our sellers. Call us today and join over 1,500 satisfied customers!
COMPUTER RESERVES, INC.
(800) 882-0986

FINANCIAL TECHNOLOGIES
COMPUTER SERVICES DIVISION
(703) 631-4401
OUTSOURCING - REMOTE PROCESSING
Multiple IBM ES9000 Mainframes
MVS/ESA VM/ESA
Current Software Releases,
7 days/week, 24 hours/day
Quality Service - Competitive Pricing

MCRB Service Bureau, Inc.
3090 Computer Services . . . . . **(800) 941-MCRB**

PC SOLUTIONS

Micro Focus COBOL, Dialog System, Panels2 solutions. Next EDition, Inc. . . . . **(216) 498-0602**

PURCHASING SOFTWARE

Commerce Software, Inc. (PurchaseSOL®)
Elmsford, NY . . . . . **(800) 447-7172**

REMOTE COMPUTING

ALICOMP, Inc. . . . . . **(800) 274-5556**
(See Our Ad in the MarketPlace)

RIGHTSIZING

MCRB Service Bureau, Inc.
3090 Computer Services . . . . . **(800) 941-MCRB**

SECURITY

Security Audits, Training and Consulting
NCSA is the leading source of computer security educational materials. We also conduct security audits, training and can help you develop security policies and procedures. Request our free 32-page security resource catalog.
National Computer Security Association
(717) 258-1816 Fax (717) 243-8642
76300.2567@compuserve.com
CompuServe: GO NCSAFORUM

VANGUARD Integrity Professionals
Security/Audit MVS Software . . . . (714) 939-0377

S/W QUALITY ASSURANCE

RESOURCE SOLUTIONS (800) 825-8864
SOABASE, PC guide to over 100 products, makes SQA software selection a snap. Select individual or comparative reports. Developed for the Quality Assurance Institute (QAI). 1 year subscription $135. 6050 Peachtree Parkway, Suite 340-228, Norcross, GA 30092

SOFTWARE REUSE

RPM ®
Reuse Process Manager ®
"a windows and C/S based process manager with a customizable environment for defining, measuring and practicing reuse-driven software development"
developed by Dr. Carma McClure
Extended Intelligence, Inc.
(312) 346-5345 x360

TELESERVICES

IBM Rochester TeleServices
Rochester MN . . . . . (800) 365-4426 ext. 500

Have Solutions To Sell? For Less Than $35 per issue, You Can Sell Them HERE!

In the Computerworld Marketplace Solutions Directory. You simply choose the type of listing you want, and we'll run it for 26 consecutive weeks - under the category of your choice!

Plus, you can run your listing under an additional category at a 50% discount rate. To start your Solutions Directory Listing in September, your order must be received by August 25.

Listing Type	*26X Cost*	*Description*
Basic	$899	2-line listing in plain typeface
Bold	$998	2-line listing in boldface type
Boxed	$1499	30-word company listing enclosed in box

Please Fax Your Listing/Category to: Nancy Whittaker 1-508-620-7739 (fax) **Or Call:** 1-800-343-6474 x744 (phone)

Computerworld Inc.

An IDG Company The World's Leader in Information Services on Information Technology

Publisher

Gary J. Beach

Computerworld Headquarters 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171 Phone: 508-879-0700, FAX 508-875-4394

Bill Laberis	Kevin McPherson	Matthew Smith	Steve Woit
Senior Vice-President	**Associate Publisher**	**Senior Vice-President**	**Senior Vice-President**
Editorial	**Senior Vice-President/Sales**	**Operations**	**Marketing**

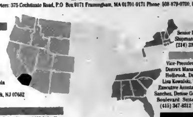
PUBLISHER'S OFFICE: *Executive Assistant to the CEO/Publisher* Karen Elliott *Assistant to Associate Publisher*, Lois Beninati **SALES:** *Display Advertising Production Manager*, Paula Wright, *Display Advertising Coordinators*, Peggy Hennessy, Lisa Tanner **SALES CLASSIFIED:** *Vice-President Recruitment Advertising* John Corrigan, *Recruitment Marketing Director*, Derek E. Hulitzky, *Product Classified Sales Manager* Connie Martin Kearns, *Solutions Directory*, Nancy Whittaker, *Classified Operations Director*, Cynthia Delany **MARKETING:** *Director Marketing Communications*, Mary Doyle, *Account Manager, Marketing Communications*, Elizabeth Phillips, *Manager Trade Shows & Conventions*, Audrey Shohan, *Marketing Communications Project Manager*, Susan Thaxter, *Administrative Assistant*, Patty White **CIRCULATION:** *Vice-President Circulation*, Gail Odeneal, *Director of Circulation Management*, Maureen Burke **PRODUCTION:** *Production Director*, Christopher P. Cuoco, *Production Manager*, Beverly Wolff **DISTRIBUTION:** *Distribution Manager*, Bob Wescott, *Traffic Manager*, Pat Walker

Sales Offices

Associate Publisher/Senior Vice-President/Sales

Kevin McPherson

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171 Framingham, MA 01701-9171 Phone 508-879-0700, FAX 508-879-0446



Northeast

Vice-President Eastern Advertising Sales: David Peterson, Senior District Managers: Bill Cadigan, Sherry Driscoll, John Watts. Sales Assistants: Alice Longley, Lisa Ikeis, Tammy Grymowicz, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700 FAX (508) 872-2915 TDD (800) 428-8244

Mid-Atlantic

Senior District Manager: Fred LoSapio, District Managers: Paula D'Amico, Rich Molden, Sales Assistants: Susan Kusnic, Joan Dellarobba, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090 FAX (201) 712-9786 TDD (800) 208-0288

South-Atlantic

Senior District Manager: Bernie Hockswender, Sales Assistant: Debra Brown, 1400 Lake Hearn Drive, Suite 330, Atlanta, GA 30319 (404) 394-0758 FAX (404) 255-5123 TDD (800) 449-4974

Midwest

District Manager: Sharon R. O'Brien, Sales Assistant: Denice Richards, 980 N. Michigan Avenue, Suite 1400, Chicago, IL 60611 (312) 214-3606 FAX (312) 214-4962

Southwest

Senior District Manager: Darren Ford, Sales Assistant: Brenda Shipman, 14651 Dallas Parkway, Suite 304, Dallas, TX 75240 (214) 233-0882 FAX (214) 385-1003 TDD (800) 822-4918

Northern California

Vice-President Western Advertising Sales: Richard Espinoza, Senior District Managers: Ernie Chamberlain, Kaye Sharbrough, Linda Holbrook, District Managers: Christine Curry, Elizabeth Cooper, Lisa Kowalski, West Coast Operations Manager: Leticia Lehane, Executive Assistant: Denise Hu, Sales Assistants: Emily Gaytan, Connie Sanchez, Denise Garcia, Andrea Zurek, Jim Schott, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX (415) 347-8312 TDD (800) 900-3179

Southwestern Regional Manager: Fran Cowen, Sales Assistant: Aileen Lim, 18800 MacArthur Blvd., Suite 500, Irvine, CA 92715 (714) 757-4123 FAX (714) 757-4124

Custom Publications

Boston: Vice President/Larry Craven, Director of Publishing Services/Carolyn Novack, Sales Assistant/Heidi Schuberthan, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700 FAX (508) 879-0446

San Francisco: West Coast Director/Elaine R. Offenbach, Sales Assistant/Nikki Wilson, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX (415) 347-8312

Client/Server Journal

Sherry Driscoll, 375 Cochituate Rd., Box 9171, Framingham, MA 01701-9171 (508) 879-0700 FAX (508) 872-2915, Kaye Sharbrough, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX (415) 347-8312

Product Classified

Sales Manager/Connie Martin Kearns, **New England** Account Executive Susan Cardona, **Mid-Atlantic** Account Executive/Michelle Reeves, **South-Atlantic** Account Executive/Kevin Gasper, **Midwest** Account Executive Jay Savell, **Northwest** Account Executive/Andrew Sambrook, **Southwest** Account Executive/Claude Garbarino, Solutions Directory/Nancy Whittaker, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474 FAX (508) 875-3202

Recruitment Advertising Sales Offices

Vice President/Recruitment Advertising John Corrigan, Marketing Director/Derek E. Hulitzky, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474

New England: Regional Manager/Nancy Percival, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474 Account Executive/Karen Ledo, (800) 343-6474

Mid-Atlantic: Regional Manager/Marty Finn, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090 Account Executive/Caren Dion, (800) 343-6474 TDD (800) 208-0288

South-Atlantic: Regional Manager/Katie Kress, 8304 Professional Hill Drive, Fairfax, VA 22031 (703) 573-4115, Sr. Account Executive/Pauline Smith (800) 343-6474

Midwest: Regional Manager/Pat Powers, 1011 East Touhy Avenue, Suite 550, Des Plaines, IL 60018 (708) 827-4433, Sr. Account Executive/Ellen Cross (800) 343-6474 TDD (800) 227-9437

West: Regional Manager/Barbara Murphy, 2171 Campus Drive, Ste. 100, Irvine, CA 92715 (714) 250-0164 Sr. Account Executive/Christopher Glenn (800) 343-6474 TDD (800) 205-5867

[illegible]

Sales Manager/Connie Martin Kearns, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474

East: Account Manager/Norma Tamburrino, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090

West: Account Manager/Jill Gross, 2171 Campus Drive, Ste. 100, Irvine, CA 92715 (714) 250-0164

IDG International Marketing Services

President/Frank Cutitta, Eastern Advertising Manager/Stephanie Lamarque, 187 Oaks Road, Framingham, MA 01701 (508) 879-0700 TDD (800) 233-0537

Western Advertising Manager/Ginny Pohlman, 140 Harbor Drive, Suite 215, Sausalito, CA 94965 (415) 331-7371 FAX (415) 331-0061

International Data Group

Patrick J. McGovern, **Board Chairman;** Walter Boyd, **President;** William P. Murphy, **Vice President Finance**

Computerworld is a publication of International Data Group, the world's largest publisher of computer-related information and the leading global provider of information services on information technology. International Data Group publishes over 220 computer publications in 63 countries. [illegible] million people read one or more International Data Group publications each month. International Data Group's publications include: ARGENTINA'S Computerworld Argentina, Infoworld Argentina; AUSTRALIA'S Computerworld Australia, Australian PC World, Australian Macworld, Network World, Mobile Business Australia, Publish!, Reseller, IDG Sources; AUSTRIA'S Computerwelt Oesterreich, PC Test; BELGIUM'S Data News (CW); BOLIVIA'S Computerworld; BRAZIL'S Computerworld, Gamepro, Game Power, Mundo IBM, PC World, Publish, Super Game; BULGARIA'S Computerworld Bulgaria, Ediworld, PC & Mac World Bulgaria, Network World Bulgaria; CANADA'S CIO Canada, Computerworld Canada, Graduate Computerworld, InfoCanada, Network World Canada, Reseller; CHILE'S Computerworld Chile, Informatica; COLOMBIA'S Computerworld Colombia, PC World; COSTA RICA'S PC World; CZECH REPUBLIC'S Computerworld, Elektronika, Macworld, PC World; DENMARK'S Communications World, Computerworld Danmark, [illegible] … SWATPro, Video Event; VENEZUELA'S Computerworld Venezuela, PC World Venezuela; VIETNAM'S PC World Vietnam

Have a Problem With Your Computerworld Subscription?

We want to solve it to your complete satisfaction, and we want to do it fast. Please write to:

COMPUTERWORLD, P.O. Box 2043, Marion, Ohio 43305-2043.

Your magazine subscription label is a valuable source of information for you and us. You can help us by attaching your magazine label here, or copy your name, address, and coded line as it appears on your label. Send this along with your correspondence

Address Changes or Other Changes to Your Subscription

All address changes, title changes, etc. should be accompanied by your address label, if possible, or by a copy of the information which appears on the label, including the coded line

Your New Address Goes Here Address shown: ☐ Home ☐ Business

Name

Company

Address

City State Zip

Name
Title **Company**
Address
City **State** **Zip**

Other Questions and Problems

It is better to write us concerning your problem and include the magazine label. Also, address changes are handled more efficiently by mail. However, should you need to reach us quickly the following toll-free number is available: **1-800-669-1002**

(Outside U.S. call (614) 382-3322)

CompuServe members can reach us at account number 73373, 1230

Advertisers' Index

AT&T Cable Systems	51
AT&T World Works	29
Banyan	61
Compaq Computer Corp.	26-27
Computer Associates	5
CW Marketplace	33
CW Circulation	45, 66
CW Custom Publications	24
CW Ancillary	76
Dell	100
General Instruments	15
Gifts in Kind America	78
Gupta	57
Hewlett-Packard	46-47, C4
IBM Personal Software Products	C3
IBM	52-53, 68-69
Information Builders	48
Intel	72-73
Lawson Software	34-35
Lotus Development Corp.	18-19
Micro Focus	11
Novell	25
Oracle Corp.	7, 9
Powersoft	58
SAS Institute	17
SAS Institute	38
Sprint	21
Sybase, Inc.	13
Symantec	30-31
Syncsort	3
Tandem	54
Toshiba	42
Workstation Group	41
Zenith Data Systems	22-23

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Marketplace Advertisers' Index
Pages 90-96

Alcomp, Inc.	(800) 274-6656
Alpine Computer Sales	(800) 653-6809
American Software	(404) 264-5770
AR	(513) 686-2001
Boxlight	(800) 708-5757
CBC Computerware	(919) 481-0041
Computer Marketplace	(800) 866-1144
Data Connections	(800) 226-1366
Dempsey Business Systems	(800) 888-2000
Pansoft Systems	(708) 674-8884
Servtek Computers, Inc.	(800) 729-3000
Spectra Equipment	(800) 870-7080
TNI	(800) 876-9470
ValueStor	(800) 873-VALU
World Data Products	(800) 553-0600

Companies in this issue

Page number refers to page on which story begins

3Com Corp. 49

A

Aberdeen Group 55
AccessWorks Communications, Inc. 50
Acer America Corp. 4
Action Technologies, Inc. 14
Adobe Systems, Inc. 8
Aegis Insurance Services, Inc. 56
Aha Software Corp. 40
AimTech Corp. 67,74
AirTouch Communications 14
Alcan Aluminum Corp. 8
Aldus Corp. 8,40
Allen Communication, Inc. 67,74
Ambra Corp. 4
American Automobile Association 50
American Cyanamid 1
American Express Co. 20
American Training International, Inc. 67
Amoco Corp. 44
Andersen Consulting 28
Apple Computer, Inc. 4,6,15,28,74
ASK Group, Inc. 8,55
Ask Me Multimedia Center, Inc. 67
Aspect Telecommunications 46
AST Research, Inc. 6
Astea International, Inc. 60
Asymetrix Corp. 67,74
AT&T Corp. 8,10,14,41,50,65
Avalon Associates 40

B

Baan International B.V. 8
Banyan Systems, Inc. 12,43
Beckmans Instruments, Inc. 90
Beech Aircraft Corp. 1
Bell Canada 65
Bell Sygma Telecom Solutions, Inc. 65
BIS Strategic Decisions 14
Borland International, Inc. 10,40,60
Bose Corp. 6
Brigham and Women's Hospital 39

C

Cabletron Systems, Inc. 49
Candle Corp. 59
Carnival Corp. 8
Cayman System, Inc. 47
Center for Electronic Records 49
Centerline Software, Inc. 59
CERN 12
Chapman and Cutler 15
Chipcom Corp. 32
Chrysler Corp. 12
Chubb Advanced Training 80
Cincom Systems, Inc. 67
Cisco Systems, Inc. 49
CommTouch Software, Inc. 49
Communications Network Architects, Inc. 43
Community Mutual Insurance Co. 62
Compaq Computer Corp. 4,12,39
CompuServe, Inc. 4
Computer Associates International, Inc. 8,55,60
Computer Sciences Corp. 41
Consumer Value Stores 41
Corporate Computing, Inc. 80
Cray Computer Corp. 32,55
Cray Research, Inc. 32,55
CrossComm Corp. 43
CUC International, Inc. 62
Cylix Communications Corp. 50

D

D. H. Andrews Group, Inc. 56
Data Research and Applications, Inc. 24
Dataquest Worldwide Services Group 43
Dataquest, Inc. 8,12,44
Dean Witter Reynolds 32
Decisis, Inc. 1
Dell Computer Corp. 6,39,41
Delrina Corp. 47
DiagSoft, Inc. 39
Dialog Information Services, Inc. 1
Digital Equipment Corp. 8,20,41,44
Dominion Textile, Inc. 56
Douglas Aircraft Co. 62
Dr Pepper Co./The Seven-Up Co. 8
Du Pont Co. 12

E

Eastman Kodak Co. 28
Eckerd Drug Co. 41
Electronic Data Systems Corp. 41,43,55
Eo, Inc. 14
Epoch Systems, Inc. 56
Escom AG 39
ETI International, Inc. 80
Expersoft Corp. 59

F

Fender Musical Instruments Corp. 56
Fidelity Investment Co. 1
First Floor, Inc. 20
Forbes, Inc. 49
Four Corners Development Partnership 40

G

Galileo International 1
Gandalf Technologies, Inc. 50
Gartner Group, Inc. 1,49
Gateway 2000, Inc. 39
General Motors Corp. 41
Genon Technology 39
Global Electronic Markets, Inc. 14
Gold Disk, Inc. 67
Groupe Bull 59
GTE Corp. 12,59
GTE Interactive Media 90
GTE Telephone Operations 12
Gupta Corp. 4,20,32

H

Hambrecht & Quist, Inc. 32
Hanna and Associates, Inc. 80
HealthInfusion, Inc. 56
Hewlett-Packard Co. 1,8,12,16,41,43,44,55,56,59,60
Hoffman-Laroche 90
Hughes Space and Communications Co. 41

I

Ibex Technologies, Inc. 47
IBM 1,4,6,8,10,14,16,28,39,41,43,44,50,55,56,59,67
IBM PC Co. 4
Illuminata 44
Illustra Information Technologies, Inc. 55
Indiana Farmers Mutual Insurance Group 1
Infoset Services Corp. 43
Informix Software, Inc. 50,55
Integrated Systems, Inc. 8
Intel Corp. 4,6,41,44,46
Interco, Inc. 4
Intercraft Co. 4
International Data Corp. 4,6,32,40
International Finance Corp. 44
InterServ 49
Iona Technologies Ltd. 59

K

Keyfile Corp. 47
Kinder-Care Learning Centers, Inc. 28
Klein Management Systems, Inc. 20
KnowledgeWare, Inc. 20,32
KPMG Peat Marwick 62

L

Lanier Worldwide, Inc. 40
Legent Corp. 16,32
Levi Strauss & Co. 56
Lotus Development Corp. 6,8,10,14
Lucid, Inc. 32

M

Macromedia, Inc. 67,74
Malliockrodt Medical, Inc. 1
Marin Research 47
Masu Mutual Life Insurance 90
McAfee Associates, Inc. 44
McConnell Consulting, Inc. 43
MCI Communications Corp. 49,50
Media Vision 32
Mellon Bank Corp. 43
Merrill Lynch & Co. 20,62
Meta Group, Inc. 1,8,43
Micrografx, Inc. 1
MicroLogic Software, Inc. 40
Microsoft Corp. 1,4,6,8,10,12,14,15,20,28,39,40,46,47,59,60,67
Microsoft Ltd. 46
Monash Information Services 32
Montage Software, Inc. 55
Motorola, Inc. 1
Mountain Network Solutions, Inc. 47
Multimedia Research Group 90

N

National Center for Atmospheric Research 55
National Semiconductor Corp. 32
National Software Testing Laboratories 1
National Westminster Bank PLC 46
NBI 65
NetCS Informationstechnik GmbH 50
NetLabs, Inc. 16
Network Express, Inc. 50
Network Managers, Inc. 8
Northern Telecom Canada Ltd. 65
Novell, Inc. 1,6,8,10,12,20,24,28,50,59,81

O

Objectivity, Inc. 59
Odin Systems, Inc. 24
Oglethorpe Power Corp. 20
Open Source Solutions, Inc. 1
OpenVision Technologies 32
Oracle Corp. 1,4,20,47,55,56,60,75
Output Technologies, Inc. 50

P

Pacific Bell 59
Palindrome Corp. 32
Parallan Computer, Inc. 32
ParcPlace Systems, Inc. 59
Peregrine Systems, Inc. 16
Peripheral Strategies, Inc. 32
Platform Computing Corp. 43
Plextor Corp. 40
Powersoft Corp. 4,20,32,80
Presbyterian Healthcare System 49
Probe Research, Inc. 14

Q

Q-Media Software Corp. 67
Quantum Corp. 6
Quicken, Inc. 8

R

Rational Software Corp. 59
Reach Software Corp. 14
Red Brick Systems 60
Revco Drug Stores, Inc. 41
Rite Aid Corp. 41

S

Salomon Brothers, Inc. 8
Sam Albert Associates 4
Seagate Technologies, Inc. 32
Sequent Computer Systems, Inc. 46
Shiva Corp. 50
Silicon Graphics, Inc. 44
Software Publishing Corp. 40
Sony Corp. 6
Space Telescope Science Institute 8,44
Sprint Corp. 65
Spry, Inc. 44,49
Sterling Software, Inc. 32
Strategic Networks Consulting, Inc. 43
Stratus Computer, Inc. 32
Summit Strategies 12
Sun Dial Systems, Inc. 1
Sun Microsystems Computer Corp. 28
Sun Microsystems, Inc. 1,8,16,28,44,55,59
SunSoft, Inc. 28,46
Superbica 60
Sybase, Inc. 1,55,60,67
Symantec Corp. 47
Synesis Corp. 90
SynOptics Communications, Inc. 49
Systems Solutions Corp. 41

T

Taligent, Inc. 14
Tatung Co. 1
The Aerospace Corp. 6
The Santa Cruz Operation 12,41
The Whittaker Corp. 24
The Yankee Group 14
Thinking Machines Corp. 8,55
Tivoli Systems, Inc. 44
Totally Non Technical Solution 1
Transare Corp. 59
Travelers Insurance Co. 14
Traveling Software, Inc. 8
Tribune Broadcasting Co. 1
Trinzic Corp. 59
Tufts Associated Health Plan, Inc. 60

U

UBS Asset Management, Inc. 1
Uniface Corp. 20
UniSQL, Inc. 55
Unitel 65
US West 14

V

Vanstar Corp. 43
Virtual Prototypes, Inc. 60

W

Wachovia Bank of North Carolina 81
Wall Data, Inc. 41
Wang Laboratories, Inc. 32
Wellfleet Communications, Inc. 49
WordPerfect Corp. 1,6,47
WorkGroup Solutions 60
WorkGroup Technologies, Inc. 4
World Bank Group 44
Wyse Technology, Inc. 39

X

X Consortium 46
X Industry Association 46
Xerox Corp. 62

Z

Zenith Data Systems 1,39

July 29 Stock Ticker

Gainers / Losers

Percent

Gainers		Losers	
Cray Computer	53.3	MathSoft (L)	-44.4
Ross Systems	36.0	Racotek Inc. (L)	-28.9
Stratus Computer Inc.	19.6	Centigram Communications	-24.3
Xilinx	15.6	Easel Corp.	-20.0
KnowledgeWare Inc.	14.7	Powersoft	-15.9
Quarterdeck Office Sys.	13.2	Micrografx Inc.	-15.9
State of the Art	12.5	Brooktrout Technology	-14.3
Netrix Corp.	12.5	Sequoia Systems Inc.	-14.0

Dollar

Gainers		Losers	
Stratus Computer Inc.	5.50	Powersoft	-8.25
Xilinx	5.13	Centigram Communications	-3.94
BMC Software Inc.	4.00	Computer Sciences	-2.25
Motorola Inc.	3.25	NetManage Inc.	-2.25
Stratacom Inc. (H)	3.00	Brooktrout Technology	-1.75
Cirrus Logic	2.88	Zilog Inc.	-1.75
Chipcom Corp.	2.75	Compression Labs Inc.	-1.63
Newbridge Networks Corp	2.63	MathSoft (L)	-1.50

[redacted]

Survival of the fittest

While July rumors about a possible relationship between **Oracle Corp. (ORCL)** and **Gupta Corp. (GPTA)** had some Wall Street analysts crying merger before investors could blink, most said it is too soon to tell whether anything will come of early talks between the two companies.

Yet several analysts agreed that Gupta's shaky standing cannot be blamed on the company's internal weaknesses alone. Adding to its woes is an overcrowded application development tools market that is becoming increasingly competitive, if not downright cutthroat.

"The market is extremely large and fragmented around different segments of users all looking for new development tools to fit distributed, open and client/server systems," said Christopher Mortenseo, an analyst at Alex. Brown & Sons in New York. As a result, he said, companies such as **KnowledgeWare, Inc.** and **Texas Instruments, Inc.** — longtime players in the application development tools market for mainframes and large systems — are scrambling to grab market share for low-end, midlevel and high-end tools.

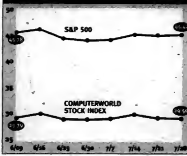
"As far as we're concerned, Powersoft is the leader in this segment and a strong Buy," Mortensen said. "Oracle is also an extremely strong Buy."

Bill Shattuck, an analyst at Mootgomery Securities in San Francisco, said a merger of Oracle and Gupta would in theory be a "good strategic fit."

"We're rating Gupta as a Hold because it's a stand-alone company that had a pretty disappointing quarter, not because of all the flak about Oracle," Shattuck said.

—Erin Callaway

STOCK TRADING INDEX



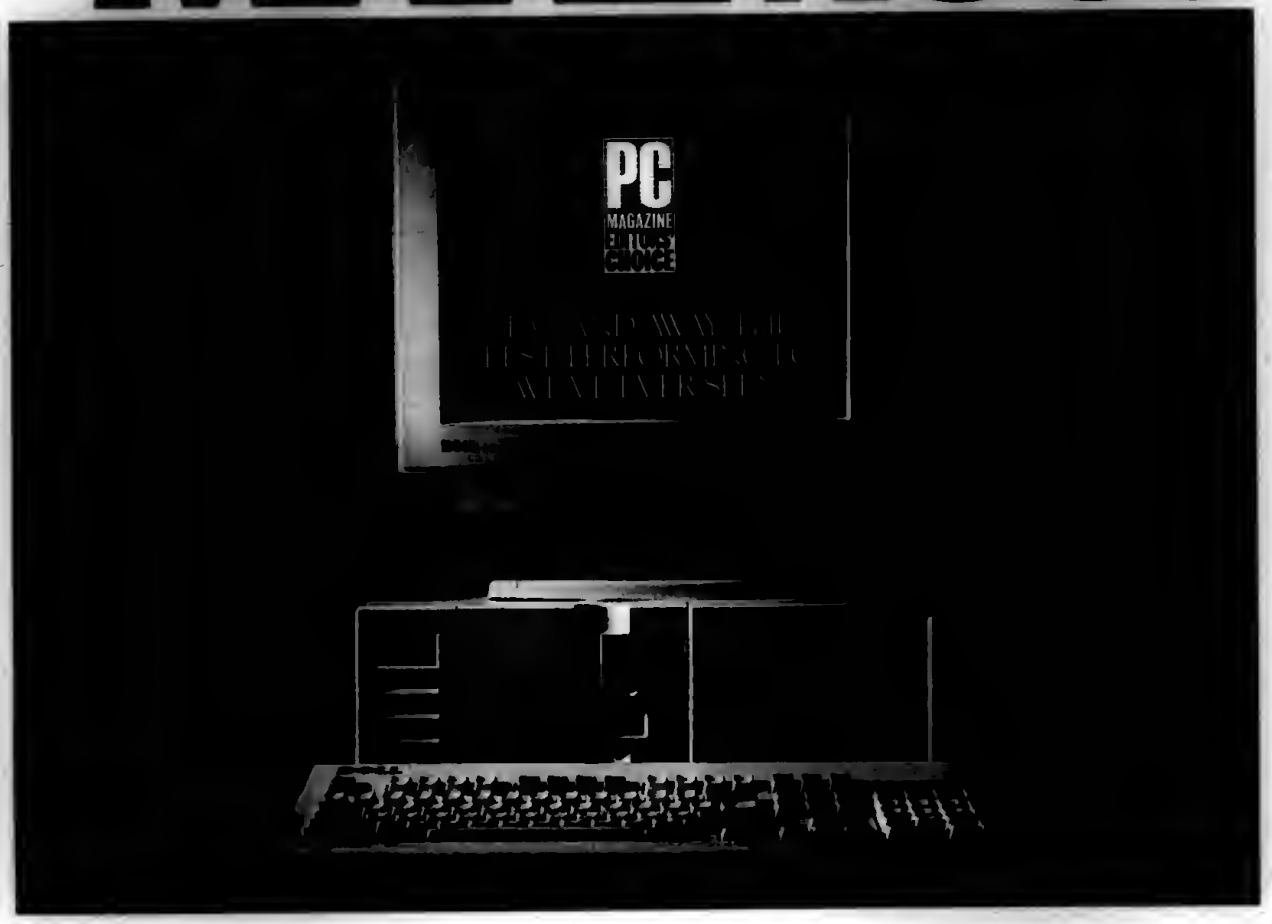
Exch	52-Week Range			July 29 3pm	Wk Net Change	Wk Pct Change
Communications and Network Systems						[illegible]
OTC	63.75	19.63	3COM Corp	52.38	1.63	3.2
NYS	45.50	36.25	Ameritech Corp.	40.88	1.50	3.5
NYS	63.88	49.50	AT&T	54.50	0.50	0.7
OTC	26.50	12.75	Banyan Systems Inc.	23.50	0.00	0.4
NYS	69.13	49.00	Bell Atlantic Corp	57.12	1.88	3.4
NYS	61.88	53.00	BellSouth Corp	62.50	2.25	3.7
NYS	21.50	8.50	Bolt, Beranek & Newman	10.75	-0.38	3.5
OTC	35.75	9.00	Brooktrout Technology	10.50	-1.75	-14.3
NYS	132.50	82.63	Cabletron Systems	101.13	-1.25	-1.2
OTC	63.00	12.25	Centigram Communications	12.25	-3.94	-24.3
OTC	60.25	31.50	Chipcom Corp	49.00	2.75	3.9
OTC	40.75	18.75	Cisco Systems Inc	20.63	-0.13	-0.6
OTC	18.50	9.25	Compression Labs Inc	10.50	-1.63	-13.4
OTC	12.50	5.13	Computer Network Tech	5.50	-0.50	-8.5
OTC	33.75	8.50	CrossComm	10.13	-0.25	-2.4
OTC	3.13	1.50	Data Switch Corp.	2.44	0.19	8.3
OTC	36.50	17.88	DSC Communications	24.25	0.19	0.8
NYS	17.63	8.25	General Datacomm Inds.	16.38	1.00	6.3
NYS	39.88	29.50	GTE Corp.	32.00	0.63	2.0
NYS	95.97	78.63	ITT Corp.	86.38	2.63	3.1
OTC	29.63	21.50	MCI Communications Corp.	22.75	-1.00	-4.2
OTC	7.75	3.50	Microcom Inc	6.75	0.13	1.9
OTC	22.50	13.50	NetManage Inc	14.00	-2.25	-13.8
OTC	2.25	3.75	Netrix Corp	4.50	0.50	12.5
OTC	8.75	3.50	Network Computing Devices	3.75	-0.38	-9.1
NYS	11.13	7.00	Network Equipment Tech.	9.25	-0.38	-3.9
OTC	23.38	10.63	Network General	16.25	1.25	8.3
OTC	9.63	6.58	Network Systems Corp.	6.88	-0.13	-1.8
OTC	73.88	28.38	Newbridge Networks Corp.	43.00	2.63	6.5
NYS	23.75	21.38	Northern Telecom Ltd.	32.13	1.50	4.9
OTC	28.00	16.50	Novell Inc	16.50	0.25	1.6
NYS	48.88	33.25	Nynex Corp	38.63	0.63	3.6
OTC	30.00	15.38	Octel Communications Corp	19.00	-0.44	-2.3
OTC	18.75	9.00	Optical Data Systems Inc.	16.06	-0.06	-0.4
OTC	7.50	3.13	Penril DataComm Networks (L)	3.88	0.25	6.9
OTC	20.75	10.00	PictureTel Corp	32.63	-0.50	2.9
OTC	8.25	2.75	Proteon Inc.	2.88	-0.25	-8.9
OTC	14.50	3.50	Racotek Inc. (L)	3.50	-1.50	-28.9
NYS	30.88	24.88	Scientific Atlanta Inc	35.00	0.50	1.4
NYS	47.00	36.75	Southwestern Bell Corp	42.00	-1.00	-2.2
NYS	40.25	31.50	Sprint Corp	36.63	-0.50	-1.3
OTC	26.75	13.50	Standard Microsystems Corp	15.00	0.38	2.6
OTC	30.75	11.50	Stratacom Inc. (H)	30.75	3.00	10.8
OTC	33.75	13.50	Synoptics Communications	34.13	-0.38	1.0
OTC	15.25	3.63	Telebit Corp.	4.75	0.19	4.1
OTC	46.00	23.00	US Robotics	26.63	1.38	5.4
NYS	50.75	38.25	US West Inc	41.00	0.50	1.2
OTC	43.88	18.75	Wellfleet Communications	19.00	-0.25	-1.2
OTC	28.25	12.75	Xircom	16.13	0.88	5.7
OTC	23.00	12.75	Xylogics Inc.	17.75	-1.50	-7.8
OTC	30.00	11.25	Xyplex Inc	11.75	-0.38	-2.3
PCs and Workstations						UP 1.66%
OTC	7.50	2.63	Advanced Logic Research	4.00	0.38	8.6
OTC	38.50	22.00	Apple Computer Inc.	33.50	2.50	7.7
OTC	33.00	12.50	AST Research Inc.	14.88	0.63	4.4
NYS	39.88	13.50	Compaq Computer Corp	31.50	0.88	2.9
OTC	30.75	15.13	Dell Computer Corp	26.25	2.25	8.7
OTC	25.00	9.25	Gateway 2000 Inc	14.00	1.25	9.0
NYS	93.63	64.38	Hewlett-Packard Co.	77.25	2.00	2.7
NYS	26.88	16.00	Silicon Graphics	23.38	2.13	10.0
OTC	33.38	18.25	Sun Microsystems Inc	22.44	0.13	0.6
NYS	50.75	28.13	Tandy Corp	37.50	1.13	3.1
OTC	5.13	2.38	Zeos International Ltd.	3.13	-0.25	-7.4
Large Systems						[illegible]
ASE	7.00	4.50	Amdahl Corp	4.63	0.50	4.0
NYS	2.63	3.63	Convex Computer	5.50	0.13	2.2
OTC	4.50	9.50	Cray Computer	3.44	0.50	53.3
NYS	33.75	19.13	Cray Research Inc.	20.50	-0.88	-4.1
NYS	10.75	4.63	Data General Corp	8.00	-0.13	-1.5
NYS	43.13	18.25	Digital Equipment Corp	19.50	0.00	0.0
OTC	0.58	2.50	Encore Computer Corp	4.75	-0.13	2.9
NYS	52.25	38.63	Harris Corp.	43.63	1.13	2.6
NYS	65.00	80.63	IBM	61.88	0.50	0.6
OTC	18.75	7.75	NetFrame	9.25	0.25	2.8
OTC	26.00	3.88	Parallan Computer	4.00	-0.13	-3.0
OTC	23.25	6.38	Pyramid Technology (L)	6.00	0.38	6.7
OTC	20.00	11.13	Sequent Computer Sys.	13.88	0.88	6.7
OTC	6.84	1.75	Sequoia Systems Inc	4.63	-0.75	-14.0
NYS	33.63	20.25	Stratus Computer Inc	33.63	5.50	19.6
NYS	16.38	8.50	Tandem Computers Inc	13.88	0.63	4.7
OTC	30.00	4.00	TriCord Systems	4.13	-0.25	5.7
NYS	16.50	8.63	Unisys Corp.	9.75	-0.13	1.4
Software						[illegible]
OTC	34.50	16.25	Adobe Systems Inc.	30.50	0.25	0.8
OTC	34.50	16.75	Aldus Corp	30.25	0.13	0.4
OTC	8.38	4.50	American Software Inc. (L)	4.75	0.00	0.0
OTC	15.75	6.75	Ask Computer Systems	13.25	0.13	1.0
OTC	61.75	37.00	Autodesk Inc.	52.88	0.88	1.7
OTC	4.25	1.25	Bachman Info. Systems (L)	1.75	-0.25	-12.5
OTC	93.00	20.50	BGS Systems Inc.	24.25	-0.75	-3.0
OTC	71.00	40.50	BMC Software Inc.	48.75	4.00	8.9
OTC	30.75	22.50	Boole & Babbage	22.13	-0.88	-3.1
OTC	20.75	8.50	Borland Int'l Inc	13.50	0.63	5.2
OTC	25.00	6.75	Brock Control Systems Inc.	8.50	0.50	6.3
OTC	4.63	2.50	CE Software	2.75	-0.13	-4.3
ASE	50.50	6.25	Cheyenne Software Inc.	8.38	0.25	3.1
OTC	14.25	7.38	Cognos Inc	11.38	0.13	1.1
NYS	44.88	27.50	Computer Associates	39.13	1.38	3.6
NYS	5.38	2.13	Computervision Corp	2.75	-0.13	-4.3
OTC	48.25	21.00	Compuware Corp	39.50	0.50	1.3
OTC	14.00	7.50	Comshare Inc.	10.50	-1.25	10.6
OTC	25.00	9.19	Corel Corp	19.50	0.38	2.0
OTC	7.50	3.00	Easel Corp	3.00	-0.75	-20.0
OTC	29.25	13.50	FileNet Corp	18.00	-0.63	-3.4
OTC	25.00	3.13	4th Dimension	3.13	-0.13	-3.8
OTC	32.50	7.13	Frame Technology	10.00	-0.13	-1.2
OTC	13.00	7.00	Group 1 Software	7.75	-1.00	12.1
OTC	31.75	6.75	Gupta	12.38	0.00	0.0
OTC	12.00	1.88	Hogan Systems Inc	7.75	0.25	3.3
OTC	29.50	16.00	IMRS	26.00	1.25	5.1
OTC	44.75	12.50	Information Resources	13.00	-0.75	-5.5
OTC	24.50	14.25	Informix Corp	20.50	0.00	0.0
OTC	12.38	8.50	Intergraph Corp	9.75	0.00	0.0
OTC	8.75	2.88	Interleaf Inc.	2.88	0.13	6.2
OTC	15.50	4.75	Intersolv Inc.	11.13	0.88	8.5
OTC	50.00	27.00	Intuit Inc.	36.00	1.50	4.2
OTC	10.75	2.25	KnowledgeWare Inc	4.88	0.61	14.7
OTC	34.75	17.50	Legent Corp	23.75	0.75	3.3
OTC	86.50	30.25	Lotus Development	31.75	1.13	3.7
OTC	16.00	6.75	Magic Software Enterprises	7.00	-0.69	-8.9
OTC	10.50	6.00	Manugistics Group Inc.	9.25	1.00	12.1
OTC	7.50	1.88	MathSoft (L)	3.00	-1.50	-44.4
OTC	11.25	4.50	McAfee Associates	7.75	0.25	3.3
OTC	17.25	8.63	Mentor Graphics	10.00	-0.88	-8.0
OTC	38.25	13.50	Micro Focus	14.63	-0.38	-2.5
OTC	11.63	4.63	Micrografx Inc.	4.63	-0.88	-15.9
OTC	54.63	35.38	Microsoft Corp	51.00	0.63	1.2
OTC	40.13	22.00	Oracle Corp	37.00	0.88	2.4
OTC	44.75	21.50	Parametric Technology	26.75	0.50	2.1
OTC	24.50	13.50	PeerPlace Systems Inc. (L)	34.00	0.88	5.0
OTC	61.50	26.00	PeopleSoft	36.00	-0.88	-2.4
OTC	6.25	3.50	Phoenix Technologies	4.63	0.19	4.1
OTC	69.50	24.25	Powersoft	43.50	-8.25	-15.9
OTC	39.75	3.50	Platinum Software	6.50	0.00	0.0
OTC	15.50	7.25	Platinum Technology	15.38	0.50	3.4
OTC	60.25	27.00	Progress Software Corp	32.50	1.00	3.2
OTC	4.13	1.94	Quarterdeck Office Sys.	2.69	0.31	13.2
OTC	29.25	9.50	Rainbow Technologies Inc. (L)	12.50	-1.25	-9.1
OTC	11.50	3.88	Rasterops	3.88	-0.25	-6.1
OTC	14.50	2.88	Ross Systems	4.75	1.13	36.0
OTC	28.75	5.00	Sapiens Int'l Corp. N.V.	6.00	0.13	3.0
OTC	14.63	9.75	Softdesk International Inc	12.25	-0.88	-6.7
OTC	8.63	3.00	Software Publishing Corp (L)	4.00	0.25	6.7
OTC	13.75	5.00	State of the Art	6.75	0.75	12.5
NYS	35.63	21.75	Sterling Software Inc.	30.00	-0.25	-0.8
OTC	21.63	6.88	Structural Dynamics Research	7.00	0.25	3.1
OTC	57.00	25.75	Sybase Inc.	38.00	-0.75	1.9
OTC	20.50	6.88	Symantec Corp.	11.50	1.00	8.0
OTC	52.75	13.00	SynOpsys	38.50	0.00	0.0
OTC	26.75	11.13	System Software Assoc	13.00	0.13	0.9
OTC	6.75	3.25	Trinzic Corp	3.75	0.00	0.0
OTC	30.00	11.75	ViewLogic Systems	17.00	0.00	0.0
OTC	23.25	11.75	VMark Software Inc.	18.13	0.13	0.7
OTC	33.25	3.50	Walker Interactive Systems	7.00	0.13	1.8
OTC	60.00	23.50	Wall Data Inc.	35.00	0.75	1.2
Semiconductors						UP [illegible]
NYS	32.75	16.75	Advanced Micro Devices	26.00	1.75	6.9
NYS	31.25	19.50	Analog Devices Inc.	26.63	-0.25	-0.9
OTC	29.62	10.94	Atmel Corp	24.81	1.31	5.6
OTC	7.50	3.43	Chips and Technologies	3.00	-0.50	13.6
OTC	44.63	23.88	Cirrus Logic	29.00	2.88	11.0
NYS	19.88	11.25	Cypress Semiconductor Corp	16.88	0.25	1.5
NYS	20.13	13.00	Dallas Semiconductor	15.00	0.00	0.0
OTC	27.75	14.75	Integrated Silicon Systems	20.88	1.00	9.9
OTC	74.50	52.25	Intel Corp	56.13	1.38	2.6
NYS	29.38	13.00	LSI Logic Corp.	27.38	0.50	1.9
OTC	26.75	12.25	Lattice Semiconductor	18.50	0.00	0.0
NYS	40.50	15.38	Micron Technology	37.38	2.25	6.4
NYS	54.88	42.13	Motorola Inc.	52.75	3.25	6.6
NYS	25.00	14.38	National Semiconductor	16.88	0.50	3.1
OTC	10.13	6.75	Sierra Semiconductor	9.25	0.12	1.4
NYS	89.50	55.75	Texas Instruments	78.75	2.13	2.8
OTC	18.88	6.50	VLSI Technology	10.25	0.12	0.9
OTC	14.50	3.13	Weitek (L)	4.25	0.25	7.1
ASE	20.38	6.13	Western Digital Corp.	13.50	1.25	8.6
OTC	39.75	29.00	Xilinx	37.00	5.13	15.6
OTC	80.75	23.75	Zilog Inc.	27.50	-1.75	-6.0
Peripherals and Subsystems						UP [illegible]
OTC	30.50	14.50	American Power Conversion	16.25	-0.50	-3.0
OTC	24.75	17.25	Banctec Inc	20.00	-0.50	-1.8
OTC	7.75	2.25	Cambex Corp	3.06	-0.13	-3.1
ASE	7.38	1.88	Cognitronics Corp	3.00	0.00	0.0
NYS	20.50	9.00	Conner Peripherals	12.13	0.00	0.0
OTC	23.50	8.75	Creative Technology Inc. (H)	21.13	0.13	0.6
OTC	15.25	4.69	Data Race Inc.	4.69	-0.31	-6.3
ASE	10.75	4.13	Dataram Corp	4.75	0.13	2.7
NYS	23.00	12.00	EMC Corp	15.00	0.13	0.8
OTC	8.75	3.13	Emulex Corp	7.38	0.00	0.0
OTC	21.00	11.75	Evans & Sutherland (L)	11.75	-0.50	-4.1
OTC	27.50	8.38	Exabyte	15.50	0.00	0.0
OTC	34.00	2.03	Intelligent Info. Systems (L)	3.16	0.11	3.9
OTC	4.50	2.00	Iomega Corp	2.50	0.13	5.3
OTC	9.75	3.13	IPL Systems Inc.	3.00	-0.50	11.4
OTC	28.50	13.75	Komag Inc	21.50	0.25	1.2
OTC	8.63	4.25	Maxtor Corp	4.63	-0.25	-5.1
OTC	8.75	4.88	Micropolis Corp	5.63	0.25	4.7
OTC	27.50	10.00	Pinnacle Micro Inc.	16.50	1.13	7.4
OTC	14.25	6.25	Printronix Inc. (H)	13.75	0.00	0.0
NYS	11.75	6.88	QMS Inc	8.63	0.63	7.8
OTC	20.75	9.38	Quantum Corp	16.50	1.00	6.5
OTC	9.13	3.62	Radius Inc.	4.38	0.25	6.1
NYS	37.75	7.63	Recognition International	7.63	-0.38	-4.7
OTC	6.88	3.63	Rexon Inc.	5.75	0.38	7.7
OTC	28.75	16.25	Seagate Technology	25.75	0.50	1.9
NYS	61.38	29.75	Storage Technology	37.00	0.38	1.0
NYS	32.38	21.38	Tektronix Inc.	31.38	0.00	0.0
NYS	104.88	69.88	Xerox Corp	102.75	2.25	2.2
Services						[illegible]
OTC	25.50	15.13	American Mgmt. Systems	25.13	0.50	2.0
NYS	4.23	2.63	Anacomp Inc. (L)	2.63	0.00	0.0
OTC	23.50	10.50	Analysts Int'l	16.75	-0.25	1.2
NYS	56.88	47.63	Auto Data Processing	51.50	0.50	1.0
OTC	16.75	10.50	Cambridge Tech. Partners	15.50	1.50	8.8
NYS	27.13	14.75	Ceridian Corp	25.50	1.00	4.1
NYS	24.25	14.00	Comdisco Inc.	18.50	0.25	1.1
OTC	17.50	5.66	Computer Horizons	12.25	0.75	7.1
NYS	45.25	28.14	Computer Sciences	43.75	-2.25	-5.1
NYS	9.75	6.00	Computer Task Group	8.75	0.13	1.3
NYS	32.38	8.50	CompUSA Inc.	8.63	0.13	1.9
OTC	13.50	6.38	Control Data Systems Inc. (L)	6.88	0.13	1.9
OTC	11.00	6.13	Egghead Discount Software (L)	6.50	0.00	0.0
NYS	38.00	26.80	General Motors E (EDS)	35.75	1.25	3.7
OTC	22.75	7.25	Intacom Corp (L)	8.13	0.02	0.1
OTC	28.00	13.63	Intelligent Electronics	14.00	-0.25	-1.7
OTC	22.50	7.25	Merisel (L)	7.25	-0.88	-10.8
OTC	32.50	9.75	MicroAge Inc	9.75	-0.25	-2.5
OTC	40.50	28.38	Paychex	35.50	-0.25	-0.7
NYS	39.75	31.63	Policy Management Sys.	34.13	0.88	2.6
NYS	25.50	18.62	Reynolds and Reynolds	24.63	-0.25	-1.0
OTC	28.50	16.25	SEI Corp	17.38	-0.25	-1.4
OTC	29.50	17.50	Shared Medical Systems	25.13	0.88	3.6
OTC	31.00	5.56	SHL Systemhouse	5.56	-0.31	-5.1
OTC	26.50	9.25	Software Spectrum Inc.	13.50	1.38	11.9

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

Copyright Nordby International, Inc., Louisville, CO
This information is based on sources believed to be reliable, and while extensive efforts are made to assure its accuracy, no guarantees can be made. Nordby International and Computerworld assume no liability for any inaccuracies. For information on Nordby International's Data-On-Demand services for any of the above companies call Nordby International at (800) 926-7404.

Second-class postage paid at Framingham, Mass., and additional mailing offices. Posted under Canadian International Publication agreement #0385697. Computerworld (ISSN 0010-4841) is published weekly, except a single combined issue for the last week in December and the first week in January by Computerworld, Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Copyright 1994 by Computerworld, Inc. All rights reserved. Computerworld can be purchased on microfilm and microfiche through University Microfilms Inc., 300 N. Zeeb Road, Ann Arbor, Mich. 48106. Computerworld is indexed. Back issues, if available, may be purchased through the circulation department. Photocopy rights: permission to photocopy for internal or personal use is granted by Computerworld, Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, MA 01970. Reprints (minimum 500 copies) and permission to reprint may be purchased from Sharon Bryant, Computerworld, Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Requests for missing issues will be honored only if received within 60 days of issue date. Subscription rates: $6.00 a copy; U.S. — $48 a year; Canada — $110 a year; Central & So. America — $150 (surface) a year; Europe — $295 a year; all other countries — $295 a year. Subscriptions call toll free (800) 669-1002. POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, P.O. Box 2044, Marion, OH 43305.

PENTIUM MAXIMUS.



Sounds like the folks who test PCs for a living had to tighten their old safety belts when they tested our latest Pentium™ Processor OmniPlex systems. Besides calling it, "the best performing PC we've ever seen," *PC Magazine* said "on our benchmark tests, the OmniPlex was unmatched," and, "this EISA/PCI-based OmniPlex is truly an impressive machine."

We gave our OmniPlex both a PCI and a EISA bus, a 1GB SCSI II hard drive, and a PCI local bus video benchmarked at 50 million Winmarks.[1] To put it a bit differently, we squeezed every single available ounce of performance out of the Pentium processor.

Call today to order your very own Dell OmniPlex. You'll have one of the sweetest Pentium systems on the face of the planet.

But don't quote us. Quote *PC Magazine*.

DELL® OMNIPLEX™ 566 PENTIUM™ PROCESSOR 66MHz SYSTEM

$6,977

BUSINESS LEASE[2] $251/MO.

32MB RAM (192MB MAX RAM)

1GB SCSI II HARD DRIVE

5 EISA EXPANSION SLOTS AVAILABLE (3 EISA MASTER, 2 PCI/EISA MASTER)

2MB VIDEO RAM

ULTRASCAN™ 15ES MONITOR (15" CRT, NI)

COMBO DISKETTE DRIVE

NEC TRIPLE SPEED CD-ROM

MS-DOS® 6.2/MICROSOFT® WINDOWS™ 3.1/MOUSE

ORDER CODE #500015

90MHz PENTIUM PROCESSOR OMNIPLEX SYSTEMS AVAILABLE NOW

DELL™

TO ORDER, CALL

800-285-9567

HOURS: MON-FRI 7AM-9PM CT SAT 10AM-6PM CT SUN 12PM-5PM CT

CANADA: 800-668-3021. MEXICO CITY: 228-7811 KEYCODE #11HN3

[1]Source: PC Magazine 4/12/94. [2]Prices valid in the U.S. only. Some products and promotions not available in Canada or Mexico. [3]Business leasing arranged by Leasing Group, Inc. The Intel Inside and Pentium Processor logos and Pentium are trademarks of Intel Corporation. MS-DOS and Microsoft are registered trademarks and Windows is a trademark of Microsoft Corporation. Dell disclaims proprietary interest in the marks and names of others. ©1994 Dell Computer Corporation.

PowerPC

CONTINUED FROM PAGE 1

coming out next year," said Jim Hansell, vice president of investment systems at UBS Asset Management, Inc. "I don't see any of the big or small application companies coming out and suggesting you run it on anything other than a 486 or a Pentium, and until we do, [PowerPC] won't be a major consideration."

The hardware/software question is an issue because IBM is readying for mid-October the release of three PowerPC systems based on its PowerPC Reference Platform (Prep) specification.

Big-name U.S.-based vendors, including Zenith Data Systems and Motorola, Inc., are expected to ship systems compatible with the IBM-fostered Prep specification as early as September. Tatung Co. and several other Taiwanese manufacturers will deliver systems that support Prep in early fall [CW, June 6].

To bolster the positioning of the upcoming OS/2 for the PowerPC, IBM is expected this week to sign a deal for an authoring tool to boost application developers' efforts, sources said.

The authoring tool comes from Totally NonTechnical Solutions, a small start-up in Evanston, Ill., sources said. The deal with that company will give third-party application developers an easy way to voice-enable their applications, sources said.

Don't see dollar signs

Many application software developers, however, are still unsure about the financial opportunity PowerPC represents. Most are still laser-focused on the fat part of the market just to make a living. And that means Windows.

"I don't even see PowerPC in the game yet because it just doesn't matter to applications developers" focused on trying to compete with Microsoft Corp. in the Intel Corp.-compatible market, said Paul Grayson, chairman of Micrografx, Inc. in Richardson, Texas.

Grayson and other developers said once an installed base of PowerPC systems exists, it might make sense to develop for it.

But hardware developers taking a *Field of Dreams* approach may have a rude awakening if they believe that once they build it, the software will come.

"So long as we can run off-the-shelf software and buy standard components for it, we don't care what architecture or processor a box is based on," said Victor Mutnick, corporate vice president at New York Life Insurance Co., referring to IBM's PowerPC plans. More than the availability of PowerPC-based software, his main concern is making sure he does not get shut out of the mainstream market, as he was with IBM's Micro Channel Architecture.

The fate of IBM's OS/2 is another subplot of the PowerPC hardware announcements. The first Prep-compliant systems will most likely favor Windows NT, with IBM's AIX Unix operating system as another option.

Windows NT for PowerPC will ship within 60 days of Windows NT 3.5, or in late November, according to Microsoft officials. Meanwhile, the ship date for OS/2 for PowerPC has now slipped into the first quarter of 1995, sources said. Because of this, IBM has reversed its earlier plans not to ship PowerPC hardware until OS/2 is available for it [CW, May 23] and will make Windows NT and AIX 4.1 available with these first machines, according to sources close to the company.

IBM is expected to announce a 1995 availability date for OS/2 when it announces its hardware. Still, if NT gets too much of a head start in the market, OS/2 could end up sledding uphill once again.

"But I don't think NT shipping earlier than OS/2 kills OS/2 because NT still faces the same compatibility and scalability problems as OS/2," said Randell Flint, president of Sun Dial Systems, Inc. in Seal Beach, Calif.

Some corporate users said that while they will not be buying much in the way of PowerPC boxes for a while, the appearance of hardware — with or without software — is still welcomed.

"If you're a buyer, you watch people come out with the first thing, and if you have the budget maybe you try to evaluate it," said David Pinkard, a technical consultant at Mallinckrodt Medical, Inc. in St. Louis. "That technology may not mature for another year or two and become attractive pricewise for 12 months or so. But by the time it does, you learn a lot about it and so does the manufacturer."

Users would welcome Apple clones

With rumors swirling about Apple Computer, Inc.'s efforts to create a clone market for its technology, this much is certain: Users are looking forward to such a development.

Still, they worry about compatibility and cost of ownership issues.

Apple Executive Vice President Ian Diery said last week that the company remains intent on licensing its technology and is seeking agreements with vendors in markets. An Apple spokeswoman said the company has not yet signed any licensing agreements for the Macintosh operating system or for Power Macintosh technology.

Apple is also believed to still be working diligently with IBM to agree on a common design specification for PCs based on the PowerPC chip — the PowerPC Reference Platform specification, also known as "Prep."

Users last week said it is important for Apple to reach design harmony with IBM because such a move would encourage potential licensees, who might otherwise balk at building an Apple system that will not conform to IBM specifications.

"The common spec is going to be one of the key factors that make a clone market happen. It would be real stupid to back off that," said Marc Kilgore, vice president of information services at the City and County Employees Credit Union in St. Paul, Minn.

Todd Nugent, IS director for the Chapman and Cutler law firm in Chicago, added that having alternative suppliers would also keep Macintosh hardware competitively priced.

—Mark Hulper

Agents

CONTINUED FROM PAGE 1

services, he added, as well as a vehicle for sharing open-source intelligence with sister agencies such as the National Security Agency and the Defense Intelligence Agency.

Naturally, the spy agencies are keenly aware of the danger of security breaches from Internet hackers. Markowitz said they are installing a commercial-grade "firewall" — essentially a server with access-control software — to protect internal computer networks from Internet intrusions.

In addition, a special, undisclosed hardware device will allow analysts to transfer Internet files to their high-security workstations while preventing file transfers in the opposite direction, Markowitz said.

These days the Internet is getting crowded with investigators of all sorts. Many private-sector researchers already use the Internet to supplement their heavy-duty use of on-line vendors such as Dialog Information Services, Inc.

For example, John F. Quinn, a business intelligence professional in Vienna, Va., and former CIA analyst in Japan, recently used the Internet's Gopher navigation tool to collect information on foreign reaction to the death of North Korea's leader.

James Cook, a California-based business investigator, runs an Internet-based discussion group called InfoPro, where information professionals swap advice and establish far-flung contacts.

A darker downside

But using the Internet for intelligence has a downside. For example, queries posted on public news groups or mailing lists may alert the world to the research topic unless the query is artfully phrased.

"There is a danger of tipping your hand," Quinn said. "I use the Internet to contact a colleague [directly], but I am loathe to post something publicly."

Another problem is information overload and the urgent need to filter incoming Internet messages. "The information will be affordable and accessible, but electronic filtering hasn't progressed as far as we'd like," Markowitz said.

Furthermore, private-sector researchers warned there are no quality-control police on the Internet. The danger of getting outdated or bad information is quite real.

On-line researcher Helen Burwell in Houston put it this way: "The Internet is a great big closet full of junk and treasures, so you have to go in there judiciously."

"You may get to know 100 to 500 new contacts, including ones in Italy and Russia, but the next question is how competent and reliable are they?" said Cook, a due diligence consultant for business investors. "You need to build a circle of trusted people."

Markowitz agreed that it takes a lot of mining to get a few nuggets from the Internet. "With open sources, there's lots more information available, but it has a poor signal-to-noise ratio," he said.

A big challenge is getting the clandestine service to accept open-source intelligence as being valuable, Quinn said, because the spy culture figures that "if it's not secret, it's not worthwhile."

One reason for the new interest in on-line resources is they are low-risk and cheap when compared with billion-dollar spy satellites at a time of shrinking budgets. Further, the spy agencies are being asked to provide unclassified reports about more diverse topics, Markowitz said.

"The reality is that open sources are now superior in many cases to existing classified sources, such as in dealing with African crises, where the intelligence community has mediocre to nonexistent capabilities," said Robert D. Steele, president of Oakton, Va.-based Open Source Solutions, Inc., a nonprofit organization that promotes the broader use of open-source intelligence.

"The creation of our office is a recognition that open sources are a valuable resource. As we draw back in some parts of the world, our office provides an information safety net," Markowitz said.

Watering holes in cyberspace

Intelligence analysts are likely to be poking around in these Internet nooks and crannies:

Open Source Intelligence Resources
Gopher: gopher oss.net

"Somalia News Update" newsletter
Usenet newsgroup: alt.current-events.somalia

China Headline News Service
E-mail: info@asiainfo.com

Reports by Voice of America correspondents
Gopher: gopher.voa.gov

Slovakia Document Store
World Wide Web: http://www/eunet.sk
Gopher: gopher.eunet.sk
E-mail: sds@slovakia.eu.net

Gateway Japan
E-mail: gwjapan@hamlet.umd.edu

Check out all the hot things you can do on the Internet! See page 49.

Wysiwyg

WACKY definitions

Acceptance testing
A lengthy and time-consuming process in which the job specification is gradually and completely altered to match the equipment-supplied.

Array
A simple but powerful method of reducing available storage.

Cycle time
The time a program takes to give you exactly the same errors you started with.

Direct access
A method of reading or writing the wrong piece of data at high speed.

Maintenance
A programming method in which development work is carried out by the programmer's children and their children's children.

Source: High Tech Joke Book (Oak Ridge Public Relations, Inc.)

Great Names

Arthur J. Datu
Vice president, information systems
Navistar International, Chicago

WYSIWYG compiled by Lory Dee
Illustration and design by Dave Marshall

The East West Foundation, a Boston-based nonprofit charity chartered to recycle computer equipment for educational purposes, is looking for co-sponsors for the development of a trial project to trade computers for guns. The foundation's idea is to offer computer systems to schools where students turn in their guns. The possible trade-in formula might work as follows:

Trade in this:	Get this computer:
Handgun, pistol	XT system with printer
Shotgun, rifle	AT system with modem and printer
Automatic weapon	Desktop publishing system

For more information, call (617) 542-1234 or send E mail to 73546,3341@compuserve.com.

Inside Lines

Keep on clicking, officer...

You may recall reports about pacemakers and electric wheelchairs going haywire due to radio interference [CW, June 20]. Well, here comes a report from the Netherlands, where a 42-year-old man from The Hague collapsed when his pacemaker failed. A policeman in the vicinity radioed for help, and as soon as he did, the pacemaker started working again. The officer, by using his transceiver, was able to keep the man alive until an ambulance arrived.

Cisco router-support monopoly ending

Both IBM's NetView/6000 and Hewlett-Packard's OpenView will shortly get their long-overdue support for Cisco's Ciscoworks, starting with an HP product introduction next week. This is a blow to Sun Microsystems, whose SunNet Manager product was — until now — the only Unix-based platform to manage Cisco routers. Indeed, a monopoly on Ciscoworks, primarily due to Cisco programmers' partiality to Sun workstations, is the main reason SunNet Manager still has the biggest market share, analysts said.

Yo, Philippe! You listening?

Although Borland Chief Executive Officer Philippe Kahn had plenty to say during a three-hour amicable jousting match with fellow object bigots such as Next's Steve Jobs and Taligent's Joe Guglielmi at Object World last week, Kahn didn't seem to be paying much attention. While Jobs and Guglielmi made their speeches, Kahn sat on stage, slouched over his portable, typing away. He'd look up from time to time, whisper to SunSoft's Bud Tribble and then go back to fiddling with his laptop. Nice manners, big guy.

IBM offices go mobile

Since early 1992, IBM's 12,000-strong field sales force has used Motorola's wireless data terminal, the KDT, or "brick," to communicate over what is now the ARDIS nationwide packet radio network. But IBM sources confirmed last week that by next April about half the force will replace this device with an IBM-manufactured PCMCIA card for their laptops that supports the ARDIS wireless protocol. The wireless-enabled laptops are the foundation of a broader mobile office strategy within IBM, the sources said.

Hey soldier, what's that in your pocket?

The Soldier's Computer will get its marching orders next week. Once a research project commissioned by the U.S. Army, the system is finally off the drawing board, according to sources close to Texas Microsystems. Originally planned as a 1-pound, cigarette-pack-size wireless communicator with a built-in global positioning system, it is now closer in size to Apple's Newton. It has a touch-screen interface and two PCMCIA slots, and Texas Microsystems expects to bring the product to the commercial market eventually, the sources said.

"HP... PA... NT... Hike"

HP has yet to port Microsoft's Windows NT to its PA-RISC architecture, but users seem keen on the notion. A daylong session on NT has popped up on the Sept. 18 agenda at the Interex HP users' conference in Denver. HP set the stage for an NT port when it developed a "bigendian" version of its PA-RISC chip late last year [CW, Dec. 13, 1993]. It has said it will offer NT on PA-RISC once the market demands it.

"City hall on the info superhighway" bragged a headline last week in The Boston Globe *about the city of Newton, Mass., and its new "high-tech" gear. But it turns out that all those wild cybersurfers in Newton are up to ta a tone-directed telephone system and an automated teller machine for making tax payments. Talk about stretching the superhighway cliche to the breaking point.... But if you'd like to motor along* Computerworld*'s own infohighway, call in with news items or tips to our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News Editor Maryfran Johnson can be reached by phone at (508) 820-8179, via the Internet at mfohnson@cw.com or through MCI Mail at 590-8017.*

How to contact *Computerworld* editors:

	Phone:	Fax:
Main office, Framingham, Mass.	(508) 879-0700	(508) 875-8931
24-hour tip line	(508) 820-8555	
Mid-Atlantic bureau, Rochelle Park, N.J.	(201) 587-0090	(201) 712-1808
Washington bureau, Washington	(202) 347-0134	(202) 347-2365
Midwest bureau, Des Plaines, Ill.	(708) 827-4433	(708) 827-9159
West Coast bureau, Burlingame, Calif.	(415) 347-0555	(415) 347-6831
Northwest bureau, Bellevue, Wash.	(206) 641-7770	(206) 747-1021

☞ **Electronic mail:** *Computerworld*'s writers and editors have individual **MCI Mail** accounts. Most of our staff members can be reached on MCI Mail by addressing messages to their first and last names as they appear on the masthead, which is opposite the editorial page. For a complete list of editorial MCI Mail addresses, message Linda Gorgone at 597-8014.

☞ Our **CompuServe** account number is 76537,2413. Please use that account only for communications with writers and editors. Direct subscription inquiries to CompuServe: 73373,1230.

☞ **Letters to the editor** and other editorial-related messages can be sent via **Internet** to letters@cw.com

☞ **Client/Server Journal:** Contact Editor Alan Alper at (508) 820-8115 or via Internet at aalper@cw.com

☞ **Subscriptions:** Inquiries and changes of address should be sent to P.O. Box 2043, Marion, Ohio 43305-2403 or call (800) 669-1002.

☞ **Reprints:** Contact Sharon Bryant at (508) 820-8125.

☞ **Rapid Reference clipping service:** (800) 343-6474 x554.

Now inside specially marked boxes.

Want to get more bang for your box? Look for one that offers OS/2® preloaded. It won't be hard to find. More than 50 major PC makers offer OS/2—companies like IBM, AST®, Dell® and HP®, to name a few.

Right out of the box, OS/2 takes advantage of your new PC in ways Windows™ simply can't. Now DOS and Windows programs can run more reliably—even faster in many cases. OS/2 multimedia delivers superior sound, faster digital video and better audio/video synch. And unlike Windows, OS/2's Workplace Shell™ interface gives you more flexibility to arrange your on-screen desktop to work (and play) the way you do.

A Preload to Greatness	Windows 3.1
Intuitive, object-oriented interface.	They're working on it.
*Reliably runs more than one program at a time.**	Keep dreaming.
Lets you print in one program while you work in another.	Good luck.
Comes with Adobe Type Manager,™ memory manager, print spooler and disk cache program.	Add-on$.

All systems go: Northgate®, TRICORD®, Wyse and many more also offer OS/2 preloaded.

There are lots of things to look for in your next PC. Make sure OS/2 is one of them.

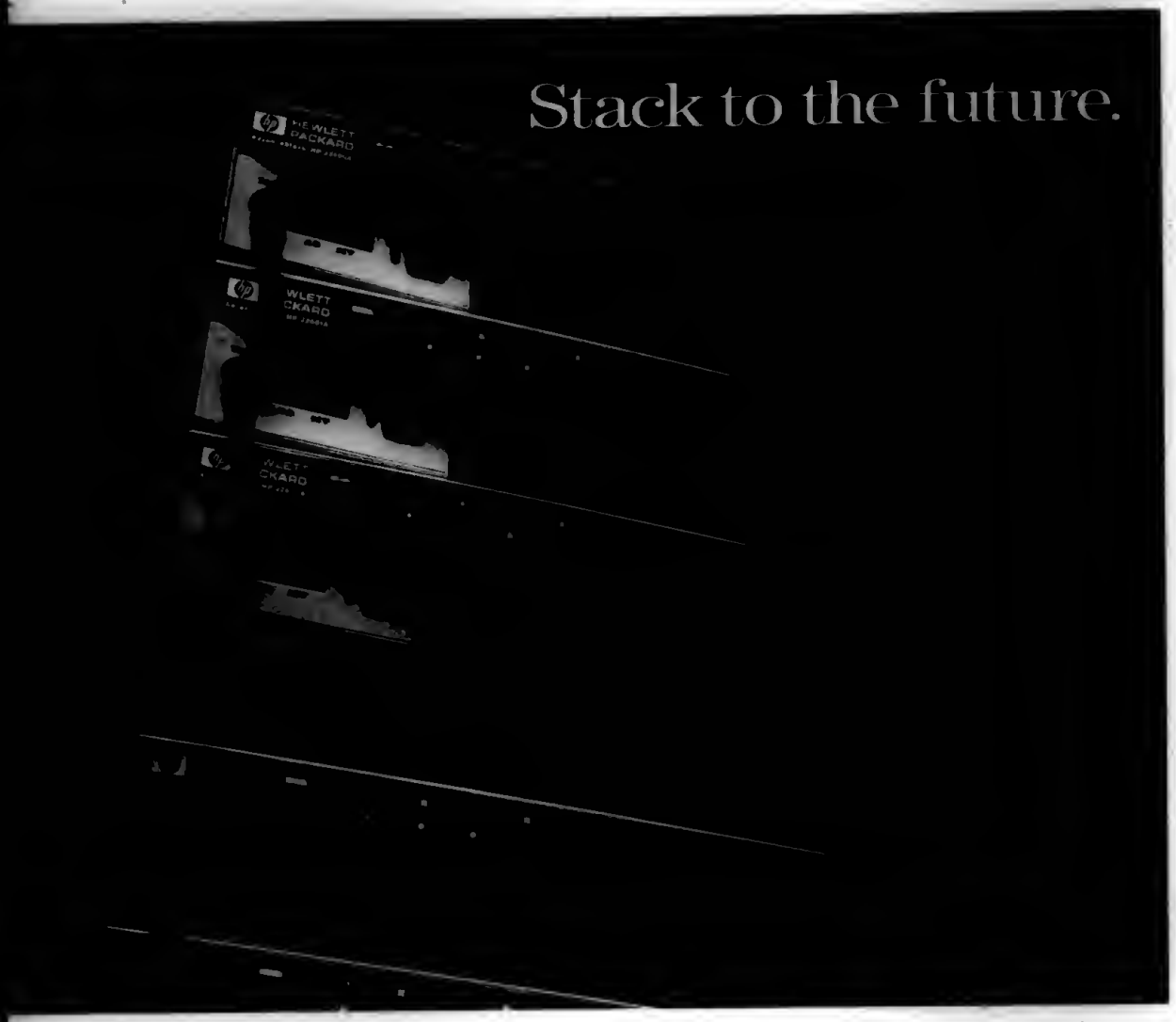
Demand OS/2 preloaded on your next PC.

To find out more about OS/2 preloaded, call 1 800 3-IBM-OS2. In Canada, call 1 800 465-7999.

Operate at a higher level.™

*Pre-emptive multitasking. This ad was created by LINTAS and got to this publication on time using DOS, Windows and OS/2 programs running on OS/2. IBM and OS/2 are registered trademarks and Workplace Shell and "Operate at a higher level" are trademarks of International Business Machines Corporation. Windows is a trademark of Microsoft Corporation. All other product names are trademarks or registered trademarks of their respective companies. © 1994 IBM Corp.

IBM®



Introducing the HP AdvanceStack family of 10Base-T stackable hubs.

If you like the front of our new hubs, wait until you see the back. That's where you'll find their unique expansion slot, and proof of their unprecedented flexibility. Buy the HP AdvanceStack today and you get a low-cost solution for your current setup. Then when you want additional functionality, all you need is a cost-effective expansion module, not a new unit. Add a lifetime warranty* backed by HP's reputation for quality and reliability, and we think you'll want to find out more about AdvanceStack right away. For fast faxed information, call **1-800-964-0714**, or for a full product brochure, **1-800-533-1333, Ext. 8117.**† And discover why so many people are looking in back of the stack–AdvanceStack, that is.

Another smart networking product from HP.

The HP AdvanceStack features an expansion slot that offers a flexible upgrade path to SNMP, bridging/routing, high-speed backbone connections and more.

- Full stack manageable via a single SNMP module
- Supports HP OpenView network management software
- Each hub ships with HP Stack Manager, a Windows-based management solution
- Management bus separate from data bus
- Maximum configuration: 784 nodes, 16 hubs
- Available in 12-, 24-, and 48-port models
- Hub-to-hub connections via industry standards-based cables
- 185-meter hub separation capability
- Hot-swap capabilities
- i960 RISC processor
- MTBF: 274,000 hours (12-port model)
- Starting under $90/port**

yes NetWare Tested and Approved

HEWLETT® PACKARD

*Customer must return warranty registration card to HP. Five-year on-site warranty; after five years return hub to HP. Power supply and fan covered by five-year on-site warranty only. †In Canada call 1-800-387-3867, Dept. 160. **Based on U.S. list price of 4/1/94.

©1994 Hewlett-Packard Company RN0088